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OFFICIAL GAZETTE

of the

UNITED STATES PATENT AND TRADEMARK OFFICE

Route to:

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U.S. DEPARTMENT OF COMMERCE

Patent and Trademark Office

OFFICIAL GAZETTE of the
UNITED STATES PATENT AND TRADEMARK OFFICE

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THE OFFICIAL GAZETTE (PATENT SECTION), issued weekly.
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GENERAL INFORMATION concerning PATENTS.
GENERAL INFORMATION concerning TRADEMARKS.

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Printing authorized by Section 11(a)3 of Title 35, U.S. P.T.O.

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PATENT AND TRADEMARK OFFICE NOTICES

Patent Cooperation Treaty (PCT) Information

For information concerning the PCT member countries see the notice appearing in the *Official Gazette* at 1109 O.G. 3 on Dec. 5, 1989.

For use of the European Patent Office as an International Searching Authority for international applications filed in the United States Receiving Office, see the notice appearing in the *Official Gazette* at 1022 O.G. 52 on Sept. 28, 1982.

For use of the European Patent Office as an International Preliminary Examining Authority for international applications filed in the United States Receiving Office, see the notices appearing in the *Official Gazette* at 1080 O.G. 2 on July 7, 1987 and at 1091 O.G. 2 on June 7, 1988.

The search fee of the European Patent Office was changed due to a difference in the exchange rate of the U.S. dollar in relation to the German Mark as of March 1, 1990, and was announced in the *Official Gazette* at 1111 O.G. 24 on Feb. 20, 1990.

International PCT fees were changed on June 1, 1989 due to a difference in the exchange rate of the U.S. dollar in relaton to the Swiss Franc and were announced in the *Official Gazette* at 1102 O.G. 90 on May 30, 1989.

Certain domestic PCT fees and charges for International Search and Preliminary Examination have been changed effective Apr. 17, 1989 and were announced in the *Official Gazette* at 1100 O.G. 24 on Mar. 7, 1989.

The current schedule of PCT fees (in U.S. dollars) is as follows:

Transmittal fee:	170.00
Search Fee	
U.S. Patent and Trademark Office (USPTO) as International Searching Authority (ISA)	
—No corresponding prior U.S. national application filed	550.00
—Corresponding prior U.S. national application filed	380.00
—Supplemental search fee, per additional invention	150.00
European Patent Office as ISA	1242.00
Preliminary examination fee	
USPTO as International Preliminary Examining Authority (IPEA)	
—Search fee paid to USPTO as ISA.	400.00
—Additional examination fee, per additional invention	130.00
—ISA not the USPTO	600.00
—Additional examination fee, per additional invention	200.00
International fees	
Basic fee	436.00
Basic Supplemental fee (for each page over 30)	9.00
Designation fee per country or region for the first 10 national or regional offices	106.00
Designation fee for 11th and subsequent designations	No Charge
Handling fee	134.00

U.S. National Stage fees

	Small Entity	Regular
USPTO was IPEA	165.00	330.00
USPTO was ISA but not IPEA	185.00	370.00
USPTO was neither ISA nor IPEA	250.00	500.00
USPTO was IPEA and all claims presented satisfied provisions of PCT Article 33(2) to (4)	25.00	50.00
—For each independent claim in excess of 3	18.00	36.00
—For each claim in excess of 20	6.00	12.00
—For each application containing a multiple dependent claim	60.00	120.00
—Surcharge for filing national fee or oath or declaration after the time limit applicable under PCT Article 22 or 39(1)	60.00	120.00
—Processing fee for filing English translation after the time limit applicable under PCT Article 22 or 39(1)	30.00	30.00

Apr. 30, 1990

HARRY F. MANBECK, Jr.
Assistant Secretary and Commissioner of Patents and Trademarks.

Notice of Maintenance Fees Payable

Title 37, Code of Federal Regulations, Section 1.362(d), effective Nov. 1, 1984, provides that maintenance fees may be paid without surcharge for a six-month period beginning 3, 7, and 11 years after the date of issue of patents based on application filed on or after Dec. 12, 1980. An additional six-month grace period is provided by 35 U.S.C. 41(b) and 37 CFR 1.362(e) for payment of the maintenance fee with the surcharge set forth in 37 CFR 1.20(k) or (l), as amended effective Apr. 17, 1989. If the maintenance fee is not paid in a patent requiring such payment the patent will expire on the 4th, 8th or 12th anniversary of the patent.

Attention is drawn to the patents which were issued on July 7, 1987 for which maintenance fees due at 3 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,677,694 through 4,679,252
Reissue Patents based on the above identified patents.

Attention is drawn to the patents which were issued on July 5, 1983 for which maintenance fees due at 7 years and six months may now be paid. The patents have patent numbers within the following ranges:

Utility Patents 4,390,995 through 4,392,256
Reissue Patents based on the above identified patents.

No maintenance fees are required for design or plant patents.

Payments of maintenance fees in patents should be directed to "Commissioner of Patents and Trademarks, Box M. Fee, Washington, D.C. 20231."

The current amounts of the maintenance fees due at 3 years and six months and seven years and six months are set forth in 37 CFR 1.20(e), (f), (h) and (i), as amended effective Apr. 17, 1989, which are reproduced below:

37 CFR § 1.20 Post-issuance fees

"(e) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after after Dec. 12, 1980 and before Aug. 27, 1982, in force

beyond 4 years; the fee is due by three years and six months after the original grant.....$245.00

"(f) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Dec. 12, 1980 and before Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant.....$495.00"

"(h) For maintaining an original or reissue patent except a design or plant patent, based on an application filed on or after Aug. 27,1982, in force beyond 4 years; the fee is due by three years and six months after the original grant:

By a small entity (§1.9(f)).....$245.00
By other than a small entity.....$490.00"

"(i) For maintaining an original or reissue patent, except a design or plant patent, based on an application filed on or after Aug. 27, 1982, in force beyond 8 years; the fee is due by seven years and six months after the original grant:

By a small entity (§1.9(f)).....$495.00
By other than a small enttity.....$990.00"

The amounts of the surcharges as amended effective Apr. 17, 1989, are set forth in 37 CFR 1.20 (k), (l) and (m) which are reproduced below:

"(k) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months , seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Dec. 12, 1980 and before Aug. 27,1982.....$120.00"

"(l) Surcharge for paying a maintenance fee during the 6-month grace period following the expiration of three years and six months, seven years and six months, and eleven years and six months after the date of the original grant of a patent based on an application filed on or after Aug. 27, 1982:

By a small entity(§1.9(f)).....$60.00
By other than a small entity.....$120.00"

"(m) Surcharge for accepting a maintenance fee after expiration of a patent for non-timely payment of a maintenance fee where the delay is shown to the satisfaction of the Commissioner to have been unavoidable.....$550.00"

Notice of Expiration of Pateats
Due to Failure to Pay Maintenance Fees

35 U.S.C. 41 and 37 CFR 1.362(g) provide that if the required maintenance fee and any applicable surcharge are not paid in a patent requiring such payment, the patent will expire at the end of the 4th, 8th, or 12th anniversary of the grant of the patent depending on the first maintenance fee which was not paid.

According to the records of the Office, the patents listed below have expired due to failure to pay the required maintenance fee and any applicable surcharge.

PATENTS WHICH EXPIRED APRIL 29, 1990
DUE TO FAILURE TO PAY MAINTENANCE FEES

Patent Number	Serial Number	Issue Date
4,326,427	06/221,239	4/27/82
4,326,438	06/216,624	4/27/82
4,326,454	06/251,275	4/27/82
4,326,695	06/225,413	4/27/82
4,326,722	06/236,066	4/27/82
4,326,783	06/247,189	4/27/82
4,326,867	06/248,842	4/27/82
4,326,998	06/247,323	4/27/82
4,327,008	06/221,146	4/27/82
4,327,089	06/215,777	4/27/82
4,327,094	06/225,749	4/27/82
4,327,114	06/223,335	4/27/82
4,327,123	06/236,243	4/27/82
4,327,132	06/240,703	4/27/82
4,327,159	06/220,281	4/27/82
4,327,160	06/220,282	4/27/82
4,584,725	06/754,658	4/29/86
4,584,727	06/623,089	4/29/86
4,584,728	06/540,437	4/29/86
4,584,730	06/631,435	4/29/86
4,584,731	06/649,078	4/29/86
4,584,744	06/417,078	4/29/86
4,584,752	06/667,576	4/29/86
4,584,754	06/641,742	4/29/86
4,584,769	06/468,990	4/29/86
4,584,774	06/674,913	4/29/86
4,584,779	06/744,697	4/29/86
4,584,783	06/600,352	4/29/86
4,584,784	06/320,063	4/29/86
4,584,790	06/668,890	4/29/86
4,584,791	06/646,373	4/29/86
4,584,800	06/352,343	4/29/86
4,584,801	06/772,645	4/29/86
4,584,809	06/559,097	4/29/86
4,584,813	06/485,596	4/29/86
4,584,824	06/494,020	4/29/86
4,584,828	06/607,515	4/29/86
4,584,833	06/648,724	4/29/86
4,584,837	06/541,247	4/29/86
4,584,838	06/690,315	4/29/86
4,584,841	06/619,221	4/29/86
4,584,844	06/647,189	4/29/86
4,584,847	06/647,356	4/29/86
4,584,864	06/611,847	4/29/86
4,584,867	06/640,125	4/29/86
4,584,869	06/522,673	4/29/86
4,584,871	06/751,662	4/29/86
4,584,872	06/722,116	4/29/86
4,584,873	06/644,527	4/29/86
4,584,875	06/606,774	4/29/86
4,584,881	06/621,118	4/29/86
4,584,889	06/684,781	4/29/86
4,584,896	06/773,105	4/29/86
4,584,898	06/334,977	4/29/86
4,584,899	06/707,105	4/29/86
4,584,901	06/499,105	4/29/86
4,584,902	06/500,008	4/29/86
4,584,909	06/559,173	4/29/86
4,584,918	06/638,960	4/29/86
4,584,919	06/773,518	4/29/86
4,584,924	06/513,120	4/29/86
4,584,931	06/728,599	4/29/86
4,584,946	06/651,687	4/29/86
4,584,952	06/678,276	4/29/86
4,584,961	06/526,360	4/29/86
4,584,966	06/718,566	4/29/86
4,584,972	06/684,576	4/29/86
4,584,977	06/718,312	4/29/86
4,584,980	06/525,629	4/29/86
4,584,983	06/536,720	4/29/86
4,584,985	06/513,835	4/29/86
4,584,991	06/561,879	4/29/86
4,584,997	06/583,724	4/29/86
4,585,001	06/573,149	4/29/86
4,585,014	06/519,527	4/29/86
4,585,027	06/614,537	4/29/86
4,585,028	06/533,945	4/29/86
4,585,029	06/698,603	4/29/86
4,585,043	06/566,821	4/29/86
4,585,049	06/435,607	4/29/86
4,585,051	06/692,891	4/29/86
4,585,052	06/650,914	4/29/86
4,585,054	06/609,669	4/29/86
4,585,056	06/601,705	4/29/86
4,585,057	06/432,034	4/29/86

Patent Number	Serial Number	Issue Date
4,585,062	06/511,660	4/29/86
4,585,072	06/570,604	4/29/86
4,585,079	06/489,463	4/29/86
4,585,087	06/740,288	4/29/86
4,585,090	06/753,106	4/29/86
4,585,111	06/671,903	4/29/86
4,585,112	06/628,501	4/29/86
4,585,118	06/579,307	4/29/86
4,585,120	06/638,282	4/29/86
4,585,123	06/761,962	4/29/86
4,585,124	06/615,803	4/29/86
4,585,137	06/593,925	4/29/86
4,585,141	06/687,057	4/29/86
4,585,155	06/604,707	4/29/86
4,585,168	06/599,545	4/29/86
4,585,170	06/638,851	4/29/86
4,585,178	06/265,061	4/29/86
4,585,193	06/617,418	4/29/86
4,585,194	06/570,197	4/29/86
4,585,196	06/583,606	4/29/86
4,585,198	06/529,034	4/29/86
4,585,201	06/633,249	4/29/86
4,585,202	06/731,842	4/29/86
4,585,204	06/609,831	4/29/86
4,585,211	06/690,681	4/29/86
4,585,217	06/534,184	4/29/86
4,585,228	06/646,901	4/29/86
4,585,231	06/460,456	4/29/86
4,585,233	06/614,069	4/29/86
4,585,250	06/561,714	4/29/86
4,585,261	06/673,673	4/29/86
4,585,262	06/709,417	4/29/86
4,585,267	06/598,587	4/29/86
4,585,270	06/562,409	4/29/86
4,585,272	06/544,896	4/29/86
4,585,274	06/611,897	4/29/86
4,585,275	06/594,525	4/29/86
4,585,302	06/526,373	4/29/86
4,585,325	06/589,006	4/29/86
4,585,337	06/692,011	4/29/86
4,585,340	06/551,016	4/29/86
4,585,345	06/587,529	4/29/86
4,585,349	06/650,300	4/29/86
4,585,358	06/613,295	4/29/86
4,585,361	06/769,668	4/29/86
4,585,363	06/613,215	4/29/86
4,585,364	06/424,296	4/29/86
4,585,365	06/604,899	4/29/86
4,585,367	06/698,450	4/29/86
4,585,370	06/728,034	4/29/86
4,585,376	06/610,037	4/29/86
4,585,378	06/655,735	4/29/86
4,585,384	06/687,187	4/29/86
4,585,385	06/671,804	4/29/86
4,585,387	06/540,791	4/29/86
4,585,410	06/571,333	4/29/86
4,585,415	06/597,840	4/29/86
4,585,421	06/554,561	4/29/86
4,585,423	06/599,745	4/29/86
4,585,424	06/740,343	4/29/86
4,585,425	06/703,692	4/29/86
4,585,426	06/579,143	4/29/86
4,585,430	06/586,680	4/29/86
4,585,440	06/747,445	4/29/86
4,585,444	06/477,805	4/29/86
4,585,455	06/546,435	4/29/86
4,585,456	06/588,579	4/29/86
4,585,461	06/636,482	4/29/86
4,585,470	06/65[illegible]88	4/29/86
4,585,475	06/314,107	4/29/86
4,585,477	06/699,506	4/29/86
4,585,497	06/547,943	4/29/86
4,585,501	06/755,372	4/29/86
4,585,514	06/664,426	4/29/86
4,585,521	06/612,360	4/29/86
4,585,527	06/695,193	4/29/86
4,585,546	06/490,075	4/29/86
4,585,549	06/574,717	4/29/86
4,585,562	06/578,364	4/29/86
4,585,587	06/663,057	4/29/86
4,585,588	06/684,038	4/29/86
4,585,602	06/616,198	4/29/86
4,585,608	06/383,405	4/29/86
4,585,617	06/751,704	4/29/86
4,585,619	06/731,045	4/29/86
4,585,624	06/673,240	4/29/86
4,585,627	06/328,654	4/29/86
4,585,632	06/682,094	4/29/86
4,585,646	06/617,594	4/29/86
4,585,653	06/686,232	4/29/86
4,585,655	06/759,502	4/29/86
4,585,656	06/642,149	4/29/86
4,585,659	06/643,009	4/29/86
4,585,663	06/747,448	4/29/86
4,585,690	06/668,092	4/29/86
4,585,725	06/641,102	4/29/86
4,585,727	06/635,110	4/29/86
4,585,750	06/705,988	4/29/86
4,585,752	06/640,874	4/29/86
4,585,755	06/728,019	4/29/86
4,585,757	06/635,219	4/29/86
4,585,758	06/690,386	4/29/86
4,585,762	06/513,451	4/29/86
4,585,764	06/725,448	4/29/86
4,585,767	06/619,703	4/29/86
4,585,769	06/662,187	4/29/86
4,585,772	06/512,582	4/29/86
4,585,781	06/567,005	4/29/86
4,585,789	06/508,892	4/29/86
4,585,791	06/667,367	4/29/86
4,585,795	06/726,299	4/29/86
4,585,799	06/724,062	4/29/86
4,585,811	06/636,295	4/29/86
4,585,812	06/699,988	4/29/86
4,585,814	06/609,798	4/29/86
4,585,839	06/743,936	4/29/86
4,585,849	06/654,996	4/29/86
4,585,873	06/468,737	4/29/86
4,585,875	06/580,865	4/29/86
4,585,891	06/634,099	4/29/86
4,585,911	06/580,385	4/29/86
4,585,918	06/470,026	4/29/86
4,585,932	06/638,143	4/29/86
4,585,933	06/416,694	4/29/86
4,585,935	06/579,188	4/29/86
4,585,945	06/559,439	4/29/86
4,585,963	06/659,747	4/29/86
4,585,971	06/682,959	4/29/86
4,585,980	06/565,058	4/29/86
4,585,989	06/611,798	4/29/86
4,585,997	06/559,526	4/29/86
4,585,998	06/651,843	4/29/86
4,586,004	06/508,310	4/29/86
4,586,008	06/550,091	4/29/86
4,586,021	06/547,069	4/29/86
4,586,026	06/549,411	4/29/86
4,586,028	06/512,767	4/29/86
4,586,032	06/377,198	4/29/86
4,586,052	06/715,667	4/29/86
4,586,059	06/552,510	4/29/86
4,586,060	06/513,698	4/29/86
4,586,066	06/650,681	4/29/86
4,586,067	06/650,680	4/29/86
4,586,085	06/530,557	4/29/86
4,586,090	06/549,196	4/29/86
4,586,095	06/444,833	4/29/86
4,586,098	06/553,404	4/29/86
4,586,117	06/694,290	4/29/86

Patent Number	Serial Number	Issue Date
4,586,124	06/564,229	4/29/86
4,586,126	06/597,155	4/29/86
4,586,142	06/469,790	4/29/86
4,586,172	06/487,280	4/29/86
4,586,175	06/605,722	4/29/86
4,586,178	06/539,511	4/29/86
4,586,180	06/469,628	4/29/86

REISSUE APPLICATIONS FILED

Notice under 37 CFR 1.11(b). The reissue applications listed below are open to inspection by the general public in the indicated Examining Groups and copies may be obtained by paying the fee therefor (37 CFR 1.21(b)).

4,715,644, Re. S. N. 07/458,186, Filed Dec. 28, 1989, Cl. 296/97, SPRING-LOADED HINGE ASSEMBLY FOR VEHICLE, Mark Lobanoff, et al., Owner of Record: *Irvin Industries, Inc., Rochester Hills, Mich.*, Attorney or Agent: Ronald W. Wangerow, Ex. Gp.: 312

4,743,349, Re. S. N. 07/520,802, Filed May 9, 1990, Cl. 204/242, ELECTRICALLY CONDUCTIVE FIBROUS WEB SUBSTRATE AND CATHODIC ELEMENT COMPRISED THEREOF, Jean Bachot, et al., Owner of Record: *Atochem, Paris La Defense, France*, Attorney or Agent: Bruce J. Boggs, Ex. Gp.: 112

4,743,406, Re. S. N. 07/521,346, Filed May 9, 1990, Cl. 261/30, SELF-CONTAINED AIR FRESHENER AND CARTRIDGE THEREFOR, Robert L. Steiner, et al., Owner of Record: *Steiner Co., Inc., Chicago, Ill.* Attorney or Agent: Harry M. Levy, Ex. Gp.: 135

4,744,728, Re. S. N. 07/536,251, Filed May 17, 1990, Cl. 416/223R, HELICOPTER BLADE AIRFOIL, David A. Lednicer, et al., Owner of Record: *United Technologies, Corp., Hartford, Conn.* Attorney or Agent: Troxell K. Snyder, Ex. Gp.: 341

4,745,398, Re. S. N. 07/524,919, Filed May 16, 1990, Cl. 340/500, SELF-POWERED SENSOR FOR USE IN CLOSED-LOOP SECURITY SYSTEM, William E. Abel, et al., Owner of Record: *Sentrol, Inc., Portland, Oreg.*, Attorney or Agent: William O. Geny, Ex. Gp.: 268

4,845,774, Re. S. N. 07/526,211, Filed May 18, 1990, Cl. 379/433, APPARATUS FOR ANCHORING A TELEPHONE HANDSET TO A TELEPHONE HOUSING, Raymond Arzounian, Owner of Record: *Inventor*, Attorney or Agent: Leslie L. Kasten, Ex. Gp.: 261

4,876,907, Re. S. N. 07/524,961, Filed May 18, 1990, Cl. 74/331, MOTOR VEHICLE GEARBOX, Lars Andersson, et al., Owner of Record: *AB Volvo, Gothenburg, Sweden*, Attorney or Agent: Robert J. Patch, Ex. Gp.: 352

4,886,139, Re. S. N. 07/524,513, Filed May 17, 1990, Cl. 182/146, MOBILE SCAFFOLD WITH POWER-OPERATED PLATFORM ELEVATION, Gaston L. DuPont, et al., Owner of Record: *Inventor*, Attorney or Agent: William H. Wright, Ex. Gp.: 355

4,895,747, Re. S. N. 07/522,141, Filed May 11, 1990, Cl. 428/42, PRESSURE SENSITIVE ADHESIVE LABEL, Ronald B. Birkholz, et al., Owner of Record: *Minnesota Mining & Manufacturing Co., Saint Paul, Minn.*, Attorney or Agent: Leland D. Schultz, Ex. Gp.: 158

REQUESTS FOR REEXAMINATION FILED

Notice under 37 CFR 1.11(c). The requests for reexamination listed below are open to inspection by the general public in the indicated Examining Groups. Copies of the requests and related papers may be obtained by paying the fee therefor established in the Rules (37 CFR 1.19(a)).

In the event correspondence to the patent owner is not received, this notice will be considered to be constructive notice to the patent owner and reexamination will proceed (37 CFR 1.248(a)(5) and 1.525(b).

3,713,099, Reexam. No. 90/002,037, Requested June 4, 1990, Cl. 382/034, METHOD AND APPARATUS FOR IDENTIFYING LETTERS, CHARACTERS, SYMBOLS AND THE LIKE, Harold S. Hemstreet, Owner of Record: *Inventor, Wilton, Conn.*, Attorney or Agent: Pro Se, Ex. Gp.: 266, Requester: Owner

3,870,474, Reexam. No. 90/002,038, Requested June 4, 1990, Cl. 23/277, REGENERATIVE INCINERATOR SYSTEMS FOR WASTE GASES, Reagan Houston, Owner of Record: *Salem Industries, Inc., South Lyons, Mich.*, Attorney or Agent: Donald L. Otto, Ex. Gp.: 150, Requester: Richard J. Greco, Mountainside, N. J.

4,646,271, Reexam. No. 90/002,033, Requested May 31, 1990, Cl. 365/049, CONTENT ADDRESSABLE MEMORY HAVING DUAL ACCESS MODES, Kunio Uchiyama, et al., Owner of Record: *Hitachi Ltd., Tokyo, Japan*, Attorney or Agent: Antonelli, Terry & Wands, Ex. Gp.: 230, Requester: Motorola, Inc., Schaumberg, Ill.

4,706,553, Reexam. No. 90/002,039, Requested June 4, 1990, Cl. 98/115, FUME HOOD CONTROLLER, Gordon P. Sharp. et al., Owner of Record: *Phoenix Control Corp., Boston, Mass.*, Attorney or Agent: Wolf, Greenfield & Sacks, Ex. Gp.: 340, Requester: Accu Aire Controls, Inc., Bryan, Tex.

4,716,175, Reexam. No. 90/002,032, Requested May 29, 1990, Cl. 514/357, SATURATED FATTY ACID AMIDES AS INHIBITORS OF ACYL-COA: CHOLESTROL ACYLTRANSFERASE, Milton L. Hoefle, et al., Owner of Record: *Warner-Lambert Co., Ann Arbor, Mich.*, Attorney or Agent: R. G. Newtson, Ex. Gp.: 120, Requester: Owner

4,727,416, Reexam. No. 90/002,036, Requested June 1, 1990, Cl. 358/98, ELECTRONIC VIDEO DENTAL CAMERA, David H. Cooper, et al., Owner of Record: *Fuji Optical System, Inc., Los Gatos, Calif.*, Attorney or Agent: S. F. Caseiza, Ex. Gp.: 260, Requester: Wall & Roehrig, Syracuse, N. Y.

4,755,741, Reexam. No. 90/002,035, Requested June 1, 1990, Cl. 323/289, ADAPTIVE TRANSISTOR DRIVE CIRCUIT, Carl T. Nelson, Owner of Record: *Linear Technology Corp., Milpitas, Calif.*, Attorney or Agent: Fish & Neave, Ex. Gp.: 210, Requester: Benoit, Smith & Laughlin, Arlington, Va.

4,815,104, Reexam. No. 90/002,034, Requested May 29, 1990, Cl. 375/036, DIGITAL TELECOMUNICATIONS NETWORK, CROSS-CONNECT MODULE, Wayne E. Williams, et al., Owner of Record: *Telect, Inc., Liberty Lake, Wash.*, Attorney or Agent: Wells, St. John & Roberts, Ex. Gp.: 260, Requester: ADC Telecommunications, Inc., Minneapolis, Minn.

4,839,597, Reexam. No. 90/002,040, Requested June 4, 1990, Cl. 324/433, BATTERY CONDITION MONITORING SYSTEM, Robert O. Rowland, Owner of Record: *Hudson Respiratory Care, Inc., Temecula, Calif.*, Attorney or Agent: Jerry L. Seiller, Ex. Gp.: 260, Requester: Owner

4,914,593, Reexam. No. 90/002,041, Requested June 4, 1990 Cl. 364/424, METHOD FOR AUTOMATIC DEPTH CONTROL FOR EARTH MOVING AND GRADING, Christopher O. Middleton, et al., Owner of Record: *Spectra Physics, Inc., San Jose, Calif.*, Attorney or Agent: Matthew C. Rainey, Ex. Gp.: 230, Requester: Ogtek Development Co., Inc., Livermore, Calif.

Patents Available for License or Sale

4,266,112	WEB-CUTTING PROCESS, William P. Niedermeyer, 1024 Mount Mary Dr., Green Bay, Wis. 54301

4,482,939	DIRECTIONALLY VARIABLE LIGHTING ASSEMBLY, Andrew Tishman, 170 East 88th Street #8B, New York, N. Y. 10128
4,576,178	AUDIO SIGNAL GENERATOR, David W. Johnson, Box 68, 436 E. 69 Street. New York, N. Y. 10021
DES. 305,459	FEEDING NIPPLE, Lois G. Smith, 833 W. River Road, Tuscon, Ariz. 85704

Errata

"All reference to Patent No. 4,918,656 to Hiroshi Miyamoto, et al., of Japan for 'DYNAMIC RANDOM ACCESS MEMORY WITH FET EQUALIZATION OF BIT LINES' appearing in the Official Gazette of April 17, 1990 should be deleted since no patent was granted."

"All reference to Patent No. 4,909,885 to Douglas A. Swenson of Minnesota for 'APPARATUS AND METHOD FOR APPLYING HEAT-SENSITIVE ADHESIVE TAPE TO A WEB MOVING AT HIGH SPEED' appearing in the Official Gazette of March 20, 1990 should be deleted since no patent was granted."

Registration to Practice

The results of the examination for registration to practice before the United States Patent and Trademark Office held on April 4, 1990 were mailed to 360 candidates. The following list contains the names of persons who successfully passed the examination. Persons entitled at this time to receive provisional recognition pursuant to 37 CFR 10.9 (a) have been given the same to prepare and prosecute patent applications before the Office until their registration certificates are mailed to them. Final approval for registration is subject to establishing to the satisfaction of the Director of the Office of Enrollment and Discipline that the person seeking registration is of good moral character and repute. 37 CFR 10.7(a). Accordingly, any information tending to affect the eligibility of any of the following persons on moral, ethical, or other grounds should be furnished to the Director of Enrollment and Discipline on or before Aug. 24, 1990. Send information to be considered to the following address: U.S. Patent and Trademark Office, Box OED, Washington, D.C. 20231.

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DEPARTMENT OF COMMERCE

Patent and Trademark Office
37 CFR Part 5
[Docket No. 900531-0131]
RIN: 0651-AA09

Patent Law Foreign Filing Amendments

Agency: Patent and Trademark Office, Commerce
Action: Notice of Proposed Rulemaking
Summary: The Patent and Trademark Office (Office) proposes to amend the rules of practice in patent cases to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of Public Law 100-418. The proposed rules reflect changes made to 35 U.S.C. 184 which specify that a license is not required to file amendments, modifications, and supplements containing additional subject matter to a previously licensed foreign patent application if such amendments, modifications, and supplements do not change the general nature of the invention disclosed in the application in a manner which would require a corresponding United States patent application to be made available for national security inspection under 35 U.S.C. 181. These proposed regulatory changes would be applicable to most existing foreign filing license holders if their patent application did not undergo security inspection under 35 U.S.C. 181. Also, under the proposed rules, a retroactive foreign filing license may be granted in situations where a proscribed foreign filing occurred through error and without deceptive intent as opposed to the earlier standard of inadvertence.
Dates: Comments must be submitted on or before Aug. 15, 1990. An oral hearing is not scheduled.
Address: Address written comments to the Commissioner of Patents and Trademarks, Attention: Mr. T. H. Tubbesing, Special Laws Administration Group, Licensing and Review, Washington, D.C. 20231. The written comments will be available for public inspection in Crystal Plaza 3, Room lIC17, Crystal City, Va.
For Further Information Contact: Mr. T. H. Tubbesing by telephone at (703) 557-4918, or by mail marked to his attention and addressed to the Commissioner of Patents and Trademarks, Washington, D.C. 20231.
Supplementary Information: The proposed rules are intended to implement the Patent Law Foreign Filing Amendments Act of 1988, Subtitle B of the Public Law 100-418 (hereinafter the Act), which amended §§ 184, 185 and 186 of title 35, United States Code, in order to simplify the procedures for United States inventors filing and prosecuting patent applications in foreign countries. The Office does not propose any rule changes to implement the amendments to 35 U.S.C. 185 or 186 since these changes affect matters outside its jurisdiction.

Section 184 of title 35 is intended to protect United States national security interests by preventing the disclosure of potentially sensitive inventions made in the United States to foreign nationals by the act of filing a patent application in foreign countries. An inventor may not apply for a foreign patent on an invention made in the United States until at least six (6) months after the inventor has filed a United States patent application unless the inventor receives a license from the Office permitting an earlier foreign filing. This six-month period assures the Office

the opportunity to screen applications for information the disclosure of which might be detrimental to the national security. Also, § 184, as originally enacted, authorized the Office to grant a retroactive license for an unlicensed foreign filing of a patent application if the foreign filing was inadvertent and if the disclosure of the subject matter in the application would not be detrimental to United States security interests.

The original regulatory implementation of 35 U.S.C. 184 required applicants to obtain a license not only for the original foreign patent application but also for the filing of almost any information in support of the application thereby creating administrative problems for United States inventors seeking foreign patent protection. For example, foreign patent offices often demand that additional technical data, such as the melting point of a chemical, be added to a patent application. An additional foreign filing license was usually required before the inventor could submit modifications, amendments, or supplements to a previously licensed foreign patent application regardless of how trivial the change might be.

Recognizing the problems involved in obtaining these additional licenses, the Office promulgated rules in 1984 (see § 5.15(a) and 49 Fed. Reg. 13456 (April 4, 1984)) to streamline the licensing procedure. The 1984 rule change provided that an inventor may obtain in applications, the disclosure of the content of which is not potentially detrimental to United States security interests, a license which permitted the foreign filing of modifications, amendments, and supplements without further licensing if such changes were within the scope or character of the originally licensed invention (§ 5.15(a)). The 1984 rule change, however, could not be made retroactive and therefore had no effect on licenses granted under the old system. If an applicant wished to broaden a pre-April 4, 1984, foreign filing license to the scope allowed by § 5.15(a), this involved filing a separate petition under § 5.15(c) in each application.

The present Act clarifies the statutory basis for the current Patent and Trademark Office rules by providing that inventors, in most circumstances, are not required to obtain an additional license to file modifications, amendments, and supplements to their foreign applications for which a foreign filing license has been obtained under § 5.15(a). Unlike the present Office rules, the proposed rules would broaden the scope of most existing licenses provided that the conditions contained in the Act are met.

The Act and these proposed rules also address difficulties associated with attempts to procure a retroactive foreign filing license. Some applicants faced loss of their patent rights due to improper foreign filings even though they believed, in good faith, that a license was not necessary for certain minor changes to their foreign application. Court decisions have held that supplemental information filed abroad was exempt from the license requirement *only* when it was recited *verbatim* in the United States patent application, or was so commonly known that it could have been said to have been expressly disclosed in the United States application. In *re Application of Gaertner*, 604 F.2d 1348, 202 USPQ 714 (CCPA 1979). If a patent applicant did not obtain a foreign filing license from the Office, any corresponding United States patent was at risk of being held invalid under 35 U.S.C. 185 if technical information was added to the foreign application, even if the technical information was completely unrelated to United States security interests.

Loss of United States patent rights subsequent to an "inadvertent" unlicensed foreign filing could be avoided if a retroactive license was obtained under 35 U.S.C. 184. *Twin Disc, Inc. v. United States*, 10 Cl. Ct. 713, 231 USPQ 417 (Ct. Cl. 1986) and *Minnesota Mining and Manufacturing Co. v. Norton Co.*, 366 F.2d 238, 151 USPQ 1 (6th Cir. 1966), *cert. denied*, 385 U.S. 1005 (1967). While the *Gaertner* decision defined a broad range of circumstances under which a foreign filing license would be required, other court decisions made correction of licensing errors difficult by setting forth various strict interpretations of the standard of "inadvertence." *Compare Iron Ore Co. of Canada v. Dow Chemical Co.*, 177 USPQ 34 (D. Utah 1972), *aff'd*, 500 F.2d 189, 182 USPQ 520 (10th Cir. 1974) and *Reese v. Dann*, 391 F. Supp. 12, 185 USPQ 492 (D.D.C. 1975). An inventor could fail to meet the standard of "inadvertence" even if the information disclosed was not significant in nature and did not contain any sensitive national security information. For example, one decision suggested that the filing of information abroad was intentional because the inventor first considered the applicability of § 184. *Shelco, Inc. v. Dow Chemical Co.*, 322 F. Supp. 485, 168 USPQ 395 (N.D. Ill. 1970), *aff'd*, 466 F.2d 613, 173 USPQ 451 (7th Cir. 1972), *cert. denied*, 409 U.S. 876 (1972).

Under this standard, if supplemental information had been filed abroad as a considered, willful act, even though done through error in the belief that the information disclosed abroad did not exceed the scope of the disclosure in the United States patent application, the filing would not be "inadvertent"; and, therefore, the subject information could not qualify for a retroactive license.

The Act addresses these problems, and the proposed rules implement the intention of the Act. The Act changes the language of the statute to provide that an inventor may receive a retroactive license if the inventor can show that the premature filing of a foreign patent application, or the submission of supplemental information in support of a foreign patent application, was made "through error and without deceptive intent." This criterion is equivalent to that for reissue of a patent under 35 U.S.C. 251 to correct errors made without any deceptive intention. The reissue error requirement has been considered by the courts. See, e.g., *In re Weiler*, 790 F.2d 1576, 229 USPQ 673 (Fed. Cir. 1986). The applicant for a retroactive license also must show that the foreign filing did not disclose any information detrimental to the national security and that diligence was exercised in seeking a retroactive license once the applicant became aware of the proscribed foreign filing.

The Act became effective on August 23, 1988 but it does not affect any final decision made by the Office or a court, nor the rights or liabilities of any party under a patent in a case pending before a court on the above date or under any subsequent patent deriving priority rights from such patent under 35 U.S.C. 120 or 121. Therefore, the retroactive effect of the Act and the proposed rules is limited.

The text of the Patent Law Foreign Filing Amendments Act of 1988 in Public Law 100-418 is reproduced below:

Subtitle B-Foreign Filing
Sec. 9101. Increased Effectiveness of Patent Law.

(a) *Short Title.*—This section may be cited as the "Patent Law Foreign Filing Amendments Act of 1988."

(b) *Filing of Applications in Foreign Countries.*—

(1) Section 184 of title 35, United States Code, is amended—

(A) in the third sentence by—

(i) striking out "inadvertently"; and

(ii) insert ing "through error and without deceptive intent" after "filed abroad"; and

(B) by adding at the end thereof the following new paragraph:

"The scope of a license shall per mit subsequent modifications, amendments, and supplements containing additional subject matter if the application upon which the request for the license is based is not, or was not, required to be made available for inspection under section 181 of this title and if such modifications, amendments, and supplements do not change the general nature of the invention in a manner which would require such application to be made available for inspection under such section 181. In any case in which a license is not, or was not, required in order to file an application in any foreign country, such subsequent modifications, amendments, and supplements may be made, without a license, to the application filed in the foreign country if the United States application was not required to be made available for inspection under section 181 and if such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which would require the United States application to have been made available for inspection under such section 181."

(2) Section 185 of title 35, United States Code, is amended by inserting immediately before the period in the last sentence the following: ", unless the failure to procure such license was through error and without deceptive intent, and the patent does not disclose subject matter within the scope of section 181 of this title.".

(3) Section 186 of title 35, United States Code, is amended by inserting "willfully" after "whoever", the second place it appears.

(c) *Regulations.*—The Commissioner of Patents and Trademarks shall prescribe such regulations as may be necessary to implement the amendments made by this section.

(d) *Effective Date.*—(1) Subject to paragraphs (2), (3), and (4) of this subsection, the amendments made by this section shall apply to all United States patents granted before, on, or after the date of enactment of this section, to all applications for United States patents pending on or filed after such date of enactment, and to all licenses under section 184 granted before, on, or after the date of enactment of this section.

(2) The amendments made by this section shall not affect any final decision made by a court or the Patent and Trademark Office before the date of enactment of this section with respect to a patent or application for patent, if no appeal from such decision is pending and the time for filing an appeal has expired.

(3) No United States patent granted before the date of enactment of this section shall abridge or affect the right of any person or his successors in business who made, purchased, or used, prior to such date of enactment, anything protected by the patent, to continue the use of, or to sell to others to be used or sold, the specific thing so made, purchased, or used, if the patent claims were invalid or otherwise unenforceable on a ground obviated by this section and the person made, purchased, or used the specific thing in reasonable reliance on such invalidity or unenforceability. If a person reasonably relied on such invalidity or unenforceability, the court before which such matter is in question may provide for the continued manufact ure, use, or sale of the thing made, purchased, or used as specified, or for the manufacture, use, or sale of which substantial preparation was made before the date of enactment of this section, and it may also provide for the continued practice of any process practiced, or for the practice of which substantial preparation was made, prior to the date of enactment of this section, to the extent and under such terms as the court deems equitable for the protection of investments made or business commenced before such date of enactment.

(4) The amendments made by this section shall not affect the right of any party in any case pending in court on the date of enactment of this section to have its rights or liabilities—

(A) under any patent before the court, or

(B) under any patent granted after such date of enactment which is related to the patent before the court by deriving priority rights under section 120 or 121 of title 35, United States Code, from a patent or an application for patent common to both patents, determined on the basis of the substantive law in effect before the date of enactment of this section.

For greater clarity of this rule proposal, the revised text of 35 U.S.C. 184 is reproduced below:

Section 184. Filing of application in foreign country

Except when authorized by a license obtained from the Commissioner a person shall not file or cause or authorize to be filed in any foreign country prior to six months after filing in the United States an application for patent or for the registration of a utility model, industrial design, or model in respect of an invention made in this country. A license shall not be granted with respect to an invention subject to an order issued by the Commissioner pursuant to section 181 of this title without the concurrence of the head of the departments and the chief officers of the agencies who caused the order to be issued. The license may be granted retroactively where an application has been filed abroad through error and without deceptive intent and the application does not disclose an invention within the scope of section 181 of this title.

The term "application" when used in this chapter includes applications and any modifications, amendments, or supplements thereto, or divisions thereof.

The scope of a license shall permit subsequent modifications, amendments, and supplements containing additional subject matter if the application upon which the request for the license is based is not, or was not, required to be made available for inspection under section 181 of this title and if such modifications, amendments, and supplements do not change the general nature of the invention in a manner which would require such application to be made available for inspection under section 181. In any case in which a license is not, or was not, required in order to file an application in any foreign country, such subsequent modifications, amendments, and supplements may be made, without a license, to the application filed in the foreign country if the United States application was not required to be made available for inspection under section 181 and if such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which would require the United States application to have been made available for inspection under such section 181.

To implement the Act, the Office proposes to make changes to §§ 5.11(a) and (e), 5.15(a)-(c), (e) and (f), and 5.25(a).

The inspection provisions of 35 U.S.C. 181 delegate to the Commissioner of Patents and Trademarks the authority to decide which applications will be forwarded to United States defense agencies for national security inspection when the Government has no property interest in the invention. The fact that an application was forwarded to the defense agencies does not necessarily mean that the application was properly within the inspection scope of 35 U.S.C. 181.

Discussion of Specific Rule Change Proposals

Section 5.11(a), if amended as proposed, would specify when a license is required before filing any foreign application for patent including any modifications, amendments and supplements or divisions thereof. This proposal adopts the statutory definition of "application" in 35 U.S.C. 184. Also, the rule, if further amended as proposed, would clarify that the provisions of this section apply only to inventions made in the United States as stated in section 184. However, where an improvement or modification to a foreign-origin invention is made in the United States, a license would be required for the additional subject matter.

Section 5.11(e), if amended as proposed, would provide that an inventor need not obtain a supplemental license to file modifications, amendments and supplements containing additional subject matter to, or divisions of, a foreign application for which an initial foreign filing license was not required, so long as the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1 and the changes did not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. The need for a supplemental license would depend on whether the changes altered the general nature of the invention, rather than the label applied to the changes, i.e., "Continuation", "Continuation-In-Part", "Division", etc.

Authorized parties may determine whether a particular application was forwarded to the defense agencies for inspection under 35 U.S.C. 181 either by reviewing the filing receipt to determine if a license is or was granted, in which case security inspection did not occur, or by reviewing the file wrapper to determine if an access acknowledgment under 35 U.S.C. 181 is present, in which case security inspection did occur. If verification of the security inspection status of an application is needed, the authorized parties may submit a written request therefor to the Office directed to the attention of Licensing and Review. A written response from the Office will be issued. In the event Office records are not available, a *de novo* determination by the Office will be made of the need for defense agency inspection under the present national security standards. If security inspection was not required under 35 U.S.C. 181, then the provisions of the Act will convert a previously granted or implied license into one having the scope of proposed § 5.15(a).

Section 5.15(a), if amended as proposed, would adopt the specific provisions of the Act and clarify the existing rules by expressly stating that the license provisions of the paragraph are applicable to United States applications which were not required to be made available for inspection under 35 U.S.C. 181 and § 5.1. Thus, if an application was not required to be inspected but was inspected by mistake, it would be eligible for such a license. The proposed changes to the regulation would expressly apply to modifications, amendments, and supplements to a previously licensed foreign application, and divisions thereof, provided the changes do not alter the general nature of the invention in a manner which would require a corresponding United States application to have been made available for inspection under 35 U.S.C. 181. The language of § 5.15(a)(1) also has been clarified. If the filing of the foreign application was pursuant to a license granted under § 5.15 and issued prior to publication of the notice at 49 Fed. Reg. 13456 (April 4, 1984) for subject matter which was not appropriate for inspection under 35 U.S.C. 181, the license is now expanded to cover amendments, modifications, and supplements thereto, or divisions thereof, which do not

change the general nature of the invention in a manner which would require such application to be made available for security inspection under 35 U.S.C. 181. Also, paragraphs (a)(3) and (a)(4) of § 5.15 would be merged in order to more clearly define the type of subsequent changes to a previously licensed foreign patent application which may be filed without any additional license. In particular, it is made clear that these changes must not be such as to require the application to be made available for security inspection. Any questions about the security inspection status of any application or amendments, modifications, and supplements thereto or divisions thereof will be handled in the manner as described above.

Section 5.15(b), if amended as proposed, would clarify the existing rule by expressly stating that the license provisions of § 5.12(b) are applicable to United States applications which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1. The proposed amendments also would clarify the language of the paragraph and indicate that the more restrictive license under this paragraph includes authority to take actions in the foreign or international application, provided subject matter additional to that covered by the license is not involved. Section 5.15(c), if amended as proposed, would clarify the existing rule by expressly stating that the granting of a § 5.15(a) scope to a license under § 5.15(b) and conversion provisions of this paragraph are only applicable to material submitted under § 5.13 or United States applications, which are not, or were not, required to be made available for inspection under 35 U.S.C. 181 and § 5.1.

Sections 5.15(e) and (f), if amended as proposed, would substitute a reference to § 5.15(a)(3) rather than to § 5.15(a)(4) which is proposed to be eliminated as a separate paragraph. Paragraph (e) also is proposed to be amended to state that changes to the general nature of the invention, which would require the application to have been made available for inspection under 35 U.S.C. 181 and § 5.1, require a separate license.

Section 5.25(a), if amended as proposed, would provide that the inventor may receive a retroactive license if the inventor can show that the premature filing of papers in a foreign patent office was made through error and without deceptive intent. This criterion is the same as that for "error without any deceptive intention" for reissue of a patent and replaces the previous standard of inadvertence. This section would also be amended to clarify that each country in which a proscribed filing occurred must be listed in a petition for retroactive license. Also, the rule would be amended to define a verified statement as being in the form of either an oath or a declaration. Finally, the rule would be clarified by defining the period over which error without deceptive intent must be shown as being the time leading up to and including the proscribed foreign filing.

Other Considerations

The proposed rule change is in conformity with the requirements of the Regulatory Flexibility Act, 5 U.S.C. 601 *et seq.*, Executive Orders 12291 and 12612, and the Paperwork Reduction Act of 1980, 44 U.S.C. 3501 *et seq.*

The General Counsel of the Department of Commerce has certified to the Acting Chief Counsel for Advocacy, Small Business Administration, that the rule change will not have a significant adverse economic impact on a substantial number of small entities (Regulatory Flexibility Act, 5 U.S.C. 605(b)) because the proposed rules simplify the procedures for all United States inventors who file and prosecute applications in foreign countries.

The Patent and Trademark Office has determined that this proposed rule change is not a major rule under Executive Order 12291. The annual effect on the economy will be less than $100 million. There will be no major increase in costs or prices for consumers, individuals, industries, Federal, state or local government agencies, or geographic regions. There will be no significant adverse effects on competition, employment, investment, productivity, innovation, or on the ability of the United States based enterprises to compete with foreign-based enterprises in domestic or export markets.

The Patent and Trademark Office has also determined that this notice has no Federalism implications affecting the relationship between the National Government and the States as outlined in Executive Order 12612.

These proposed rules contain a collection of information requirement subject to the Paperwork Reduction Act which has previously been approved by the Office of Management and Budget under Control No. 0651-0011 with an expiration date of March 31, 1993. The average time for each petition for license under § 5.12(b) or § 5.25 is estimated to be approximately thirty (30) minutes, including time for reviewing instructions, gathering and maintaining data needed, and completing and reviewing the petition submission. Send comments regarding this burden estimate to the Patent and Trademark Office, Office of Management and Organization, Washington, D.C. 20231, and the Office of Management and Budget, Washington, D.C. 20503 (Attention: Paperwork Reduction Project 0651-0011).

List of Subjects

37 CFR Part 5
Classified information, Exports, Foreign relations, Inventions and patents.

For the reasons set forth in the preamble, 37 CFR Part 5 is proposed to be amended as set forth below. Additions are indicated by arrows (▶ ◀) and deletions by brackets ([ ]).

Part 5 - Secrecy of Certain Inventions and Licenses to Export and File Applications in Foreign Countries

1. The authority citation for Part 5 is proposed to be amended to read as follows:

Authority: 35 U.S.C. 6, 41, 181-188, ▶as amended by the Patent Law Foreign Filing Amendments Act of 1988, Pub. L. 100-418, 102 Stat. 1567;◀ the Export Administration Act of 1979, as amended, 50 U.S.C. App. 2401 *et seq.*, the Arms Export Control Act, as amended, 22 U.S.C. 2751 *et seq.*, the Atomic Energy Act of 1954, as amended, 42 U.S.C. 2011 *et seq.*, and the Nuclear Non-Proliferation Act of 1978, 22 U.S.C. 3201 *et seq.*, and the delegations in the regulations under these acts to the Commissioner (15 CFR 370.10(j), 22 CFR 125.04, and 10 CFR 810.7).

2. Section 5.11, paragraphs (a) and (e), are proposed to be revised to read as follows:

§ 5.11 License for filing in a foreign country an application on an invention made in the United States or for transmitting an international application.

(a) A license from the Commissioner of Patents and Trademarks under 35 U.S.C. 184 is required before filing any application for patent ▶including any modifications, amendments, or supplements thereto or divisions thereof◀ or for the registration of a utility model, industrial design, or model, in a foreign patent office or any foreign patent agency or any international agency other than the United States Receiving Office, if ▶the invention was made in the United States and◀:

(1) An application on the invention has been on file in the United States less than six months prior to the date on which the application is to be filed, or

(2) No application on the invention has been filed in the United States.

* * * * *

(e) No license pursuant to paragraph (a) of this section is required [if]:

(1) ▶If the◀ [The] invention was not made in the United States, or

(2) ▶If the corresponding◀ [The] United States application is not subject to a secrecy order under § 5.2, and was filed at least six months prior tc the date on which the application is filed in a foreign country[.], or

(3) If the corresponding United States application was not required to be made available for inspection under 35 U.S.C. 181 and § 5.1, for subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application for which a license is not, or was not, required under paragraph (e)(2) of this section, provided such modifications, amendments, and supplements do not, or did not, change the general nature of the invention in a manner which

would require any corresponding United States application to be or have been made available for inspection under 35 U.S.C. 181 and § 5.1

* * * * *

Section 5.15, paragraphs (a), (b), (c), (e) and (f), are proposed to be revised to read as follows:

§ 5.15 Scope of license.

(a) ▶Applications or other materials reviewed pursuant to §§ 5.12 through 5.14, which were not required to be made available for inspection by defense agencies under 35 U.S.C. 181 and § 5.1, will be eligible for a license of the scope provided in this paragraph. This license permits subsequent modifications, amendments, and supplements containing additional subject matter to, or divisions of, a foreign patent application, if such changes to the application do not alter the general nature of the invention in a manner which would require the United States application to have been made available for inspection under 35 U.S.C. 181 and § 5.1. This license also covers the inventions disclosed in foreign applications which had been granted a license under this part prior to April 4, 1984, and which were not subject to security inspection under 35 U.S.C. 181 and § 5.1.◀ Grant of ▶this◀ [a] license [under § 5.12(a)] authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency when the subject matter of the foreign or international application corresponds to that of the domestic application. This license includes authority ▶:◀

(1) To export and file all duplicate and formal ▶application◀ papers ▶in◀ [to the] foreign ▶countries◀ [country] or ▶with◀ international agencies;

(2) To make amendments, modifications, and supplements, including divisions, changes or supporting matter consisting of the illustration, exemplification, comparison, or explanation of subject matter disclosed in the application; ▶and◀

(3) To take any action in the prosecution of the foreign or international application ▶provided that the adding of◀ [; and

(4) To add] subject matter or ▶taking of◀ [take] any action under paragraphs (a)(1) ▶and (2)◀ [through (3)] of this section [which] does not change the general nature of the [subject matter disclosed at the time of filing, unless the subject matter added involves] ▶invention disclosed in the application in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1 by including◀ technical data pertaining to:

(i) Defense services or articles designated in the United States Munitions List applicable at the time of foreign filing, the unlicensed exportation of which is prohibited pursuant to the Arms Export Control Act, as amended, and 22 CFR Parts 121 through 130; or

(ii) Restricted Data, sensitive nuclear technology or technology useful in the production or utilization of special nuclear material or atomic energy, the dissemination of which is subject to restrictions of the Atomic Energy Act of 1954, as amended, and the Nuclear Non-Proliferation Act of 1978, as implemented by the regulations for Unclassified Activities in Foreign Atomic Energy Programs, 10 CFR Part 810, in effect at the time of foreign filing.

(b) ▶Applications or other materials which were required to be made available for inspection under 35 U.S.C. 181 and § 5.1 will be eligible for a license of the scope provided in this paragraph.◀ Grant of ▶this◀ [a] license [under § 5.12(b)] authorizes the export and filing of an application in a foreign country or the transmitting of an international application to any foreign patent agency or international patent agency. Further, this license includes authority to ▶export and file◀ [forward] all duplicate and formal papers ▶in foreign countries◀ [to the foreign patent agency] or ▶with foreign and◀ international patent ▶agencies◀ [agency] and to make amendments, modifications, ▶and◀ [or] supplements to ▶, file divisions of,◀ and take any action in the prosecution of the foreign or international application, provided subject matter additional to that covered by the license is not involved.

(c) A license granted under § 5.12(b) pursuant to § 5.13 or § 5.14 shall have the scope indicated in paragraph (a) of this section, if it is so specified in the license. A petition, accompanied by the required fee (§ 1.17(h)), may also be filed to change a license having the scope indicated in paragraph (b) of this section to a license having the scope indicated in paragraph (a) of this section. ▶No such petition will be granted if the copy of the material filed pursuant to § 5.13 or any corresponding United States application was required to be made available for inspection under 35 U.S.C. 181 and § 5.1.◀ The change in the scope of a license will be ▶effective◀ as of the date of the grant of the ▶petition◀ [change in scope].

(e) Any paper filed abroad or transmitted to an international patent agency following the filing of a foreign or international application which changes the general nature of the subject matter disclosed at the time of filing ▶in a manner which would require such application to have been made available for inspection under 35 U.S.C. 181 and § 5.1◀ or which involves the disclosure of subject matter listed in paragraphs (a)[4] ▶3◀ (i) or (ii) of this section must be separately licensed in the same manner as a foreign or international application. Further, if no license has been granted under § 5.12(a) on filing the corresponding United States application, any paper filed abroad or with an international patent agency which involves the disclosure of additional subject matter must be licensed in the same manner as a foreign or international application.

(f) Licenses separately granted in connection with two or more United States applications may be exercised by combining or dividing the disclosures, as desired, provided:

(1) Subject matter which changes the general nature of the subject matter disclosed at the time of filing or which involves subject matter listed in paragraphs (a)[4] ▶(3)◀ (i) or (ii) of this section is not introduced and,

(2) In the case where at least one of the licenses was obtained under § 5.12(b), additional subject matter is not introduced.

4. Section 5.25, paragraph (a), is proposed to be revised to read as follows:

§ 5.25 Petition for Retroactive License.

(a) A petition ▶for a◀ [of] retroactive license under 35 U.S.C. 184 shall be presented in accordance with § 5.13 or § 5.14 ▶(a)◀, and shall include:

(1) A listing ▶of each◀ of the foreign countries in which the ▶unlicensed◀ patent application material was filed,

(2) The dates on which the material was filed ▶in each country◀,

(3) A verified statement ▶(oath or declaration)◀ containing:

(i) An averment that the subject matter in question was not under a secrecy order at the time it was filed abroad, and that it is not currently under a secrecy order,

(ii) A showing that the license has been diligently sought after discovery of the proscribed foreign filing, and

(iii) An explanation of why the material was [inadvertently] filed abroad ▶through error and without deceptive intent◀ without the required license under § 5.11 first having been obtained, and

(4) The required fee (§ 1.17(h)).

The above explanation must include a showing of facts rather than a mere allegation of ▶action through error and without deceptive intent◀ [inadvertence]. The showing of facts ▶as to the nature of the error◀ should include statements by those persons having personal knowledge of the acts regarding filing in a foreign country and should be accompanied by copies of any necessary supporting documents such as letters of transmittal or instructions for filing. The acts which are alleged to constitute ▶error without deceptive intent◀ [inadvertence] should cover the period ▶leading up to and including each of the proscribed foreign filings◀ [from the time of filing until actual filing of the petition under this section].

May 16, 1990

HARRY F. MANBECK, JR.
Assistant Secretary and Commissioner of Patents and Trademarks

PATENT NOTICES

Certificates of Correction For Week of July 10, 1990

D. 302,813	4,814,873	4,840,815	4,853,684
PP. 6,940	4,816,416	4,841,045	4,853,694
Re. 32,905	4,816,457	4,841,326	4,853,740
Re. 33,050	4,817,083	4,841,625	4,853,803
4,521,405	4,817,122	4,841,689	4,853,940
4,627,050	4,817,585	4,842,035	4,854,514
4,666,847	4,817,711	4,842,121	4,854,684
4,686,684	4,818,347	4,842,207	4,854,839
4,722,456	4,818,718	4,842,208	4,855,089
4,746,434	4,819,136	4,842,460	4,855,489
4,750,800	4,820,575	4,843,019	4,855,492
4,752,300	4,821,051	4,843,027	4,856,578
4,755,503	4,821,655	4,843,221	4,856,706
4,755,514	4,822,421	4,844,471	4,857,298
4,758,947	4,822,564	4,845,241	4,858,097
4,760,149	4,822,869	4,845,334	4,858,143
4,762,501	4,823,455	4,845,420	4,858,588
4,765,756	4,825,210	4,845,566	4,859,179
4,767,744	4,825,384	4,845,934	4,859,350
4,768,656	4,826,603	4,846,022	4,860,149
4,774,163	4,827,137	4,846,179	4,860,743
4,780,539	4,828,793	4,846,396	4,860,958
4,784,950	4,828,859	4,846,567	4,861,053
4,785,206	4,829,063	4,846,734	4,861,204
4,788,419	4,829,823	4,847,267	4,861,483
4,795,175	4,830,055	4,847,606	4,862,276
4,795,561	4,830,767	4,847,639	4,864,090
4,796,950	4,831,373	4,848,432	4,864,378
4,797,087	4,832,865	4,848,843	4,864,400
4,798,200	4,833,347	4,849,524	4,864,638
4,798,343	4,834,481	4,849,543	4,865,083
4,798,358	4,835,420	4,849,568	4,865,651
4,800,478	4,835,827	4,849,624	4,866,943
4,801,620	4,835,924	4,849,849	4,867,303
4,802,220	4,837,319	4,850,521	4,867,576
4,804,965	4,837,336	4,851,411	4,867,711
4,806,473	4,837,381	4,851,456	4,868,169
4,807,502	4,837,761	4,851,513	4,868,185
4,810,448	4,838,247	4,852,426	4,868,907
4,810,515	4,839,025	4,852,533	4,869,497
4,812,014	4,839,150	4,853,072	4,870,003
4,813,063	4,839,552	4,853,280	4,886,396
4,813,284	4,839,966	4,853,431	4,888,183
4,813,548	4,840,019	4,853,437	4,890,331
4,814,393	4,840,316	4,853,482	4,891,036

Erratum

IN THE NOTICE OF CERTIFICATE OF CORRECTION APPEARING AT 1115 O.G. 7, of June 5, 1990, Patent No. 3,931,423 should be Patent No. 3,831,423.

Disclaimers

4,745,215.—*Robert J. Cox*, Watsonville, Calif.; *William J. Summa*, Endwell; *David W. Wang*, Vestal, both of N. Y. FLUORINE CONTAINING DICYANATE RESINS. Patent dated May 17, 1988. Disclaimer filed Apr. 16, 1990, by the assignee, International Business Machines Corp.

Hereby enters this disclaimer to claims 1, 2, 3, and 4 of said patent.

4,837,384.—*Tasadduq Khan*, Jouy en Josas; *Pierre Caron; Jean-Louis Raffestin*, both of Les Ulis, all of France. NICKEL-BASED MONOCRYSTALLING SUPERALLOY, IN PARTICULAR FOR THE BLADES OF A TURBOMACHINE. Patent dated Jun. 6, 1989. Disclaimer filed July 3, 1989, by the assignee, Office National D'Etudes et de Recherches Aerospatiales.

The term of this patent subsequent to February 13, 2007, has been disclaimed.

4,895,912.—*Yoshikatsu Satake; Yo Iizuka; Toshitaka Kouyama; Takayuki Katto; Zenya Shiiki*, all of Iwaki; *Toshiya Mizuno*, Tsuchiura, all of Japan. STRETCHED POLY(ARYLENE THIOETHER-KETONE) FILMS AND PRODUCTION PROCESS THEREOF. Patent dated Jan. 23, 1990. Disclaimer filed Feb. 14, 1990, by the assignee, Kureha Kagaku Kogyo K. K.

The term of this patent subsequent to October 10, 2006, has been disclaimed.

Disclaimer and Dedication

4,661,332.—*David E. W. Vaughan*, Flemington; *Karl G. Strohmaier*, Port Murray, both of N. J. ZEOLITE (ECR-18)ISOSTRUCTURAL WITH PAULINGITE AND A METHOD FOR ITS PREPARATION. Patent dated Apr. 28, 1987. Disclaimer and Dedication filed Apr. 19, 1990, by the assignee, Exxon Research and Engineering Co.

Hereby disclaims and dedicates to the Public the remaining term of said patent.

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Arkansas	Little Rock: Arkansas State Library	(501) 682-2053
California	Los Angeles Public Library	(213) 612-3273
	Sacramento: California State Library	(916) 322-4572
	San Diego Public Library	(619) 236-5813
	Sunnyvale Patent Clearinghouse	(408) 730-7290
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Georgia	Atlanta: Price Gilbert Memorial Library, Georgia Institute of Technology	(404) 894-4508
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PATENT EXAMINING CORPS

JAMES E. DENNY, Acting Assistant Commissioner
STEPHEN G. KUNIN, Acting Deputy Assistant Commissioner
CONDITION OF PATENT APPLICATIONS AS OF May 19, 1990

PATENT EXAMINING GROUPS	Actual Filing Date of Oldest New Case Awaiting Action
CHEMICAL EXAMINING GROUPS	
GENERAL METALLURGICAL, INORGANIC, PETROLEUM AND ELECTRICAL CHEMISTRY, AND ENGINEERING, GROUP 110—D. E. TALBERT, Director.	7-7-87
ORGANIC CHEMISTRY GROUP 120—JOHN F. TERAPANE, JR., Director	10-18-88
SPECIALIZED CHEMICAL INDUSTRIES AND CHEMICAL ENGINEERING, GROUP— 130 BARRY S. RICHMAN, Director	5-12-88
HIGH POLYMER CHEMISTRY, PLASTICS, COATING, PHOTOGRAPHY, STOCK MATERIALS AND COMPOSITIONS, GROUP 150—J. O. THOMAS, Director	4-5-88
BIOTECHNOLOGY, GROUP 180—J. E. KITTLE, Director	1-28-87
ELECTRICAL EXAMINING GROUPS	
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MATERIAL SHAPING, ARTICLE MANUFACTURING AND TOOLS, GROUP 320—N. GODICI, Acting Director	6-23-88
MECHANICAL TECHNOLOGIES AND HUSBANDRY PERSONAL TREATMENT INFORMATION, GROUP 330—J. J. LOVE, Director	10-25-88
SOLAR, HEAT, POWER, AND FLUID ENGINEERING DEVICES, GROUP 340—C. CROYLE, Acting Director	2-26-88
GENERAL CONSTRUCTIONS, PETROLEUM AND MINING ENGINEERING, GROUP 350— A. L. SMITH, Director	5-5-89

Expiration of patents: The patents within the range of numbers indicated below expire during May 1990 except those which may have had their terms curtailed by disclaimer under the provisions of 35 U.S.C. 253. Other patents, issued after the dates of the range of numbers indicated below, may have expired before the full term of 17 years for the same reasons, or have lapsed under the provisions of 35 U.S.C. 151.

Patents	Numbers 3,729,744 to 3,736,594 inclusive
Plant Patents	3,321 to 3,349 inclusive

REEXAMINATIONS

JULY 10, 1990

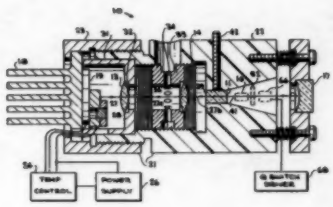
Matter enclosed in heavy brackets [ ] appears in the patent but forms no part of this reexamination specification; matter printed in italics indicates additions made by reexamination.

B1 4,701,929 (1323rd)

LASER DIODE PUMPED SOLID STATE LASER

Thomas M. Baer, Mountain View, and Mark S. Keirstead, San Jose, both of Calif., assignors to Spectra-Physics Inc, San Jose, Calif.

Reexamination Request No. 90/001,831, Aug. 24, 1989.
Reexamination Certificate for Patent No. 4,701,929, issued Oct. 20, 1987, Ser. No. 29,,836, Mar. 24, 1987.
Int. Cl.[5] H01S *3/10*
U.S. Cl. 372—71



AS A RESULT OF REEXAMINATION, IT HAS BEEN DETERMINED THAT:

Claims 2, 9, 12 and 13 are cancelled.

Claims 1, 3, 5, 10, 15 and 16 are determined to be patentable as amended.

Claims 4, 6–8, 11, 14 and 17–20, dependent on an amended claim, are determined to be patentable.

1. A high efficiency, laser diode *array* pumped, compact solid state laser, comprising:

a rare earth doped solid laser rod having a front end and a back end;

a housing with means holding the laser rod in fixed position in the housing with its front end forward;

a laser diode *array* secured in the housing behind and in optical alignment with the rod, said diode *array* being focused on the back end of the rod for pumping the rod, said diode *array* having an output frequency which is absorbed by the rare earth to excite the laser rod;

laser cavity means defining a laser cavity mounted in the housing with the rod in the cavity, the laser cavity means including output coupler means;

means for matching inside the laser rod an image of the laser diode *array* with a lasing beam volume of the laser cavity.

REISSUES

JULY 10, 1990

Matter enclosed in heavy brackets [ ] appears in the original patent but forms no part of this reissue specification; matter printed in italics indicates additions made by reissue.

Re. 33,254

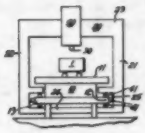
BRIDGE TYPE COORDINATE MEASURING MACHINE

Robert W. Brandstetter, 418 Cherrywood Dr., Fairborn, Ohio 45324

Original No. 44,594,791, dated Jun. 17, 1986, Ser. No. 694,378, Jan. 24, 1985. Application for reissue Jun. 17, 1988, Ser. No. 208,315

Int. Cl.[5] **G01B** *5/03, 7/03*

U.S. Cl. 33—503 **89 Claims**



1. A bridge type coordinate measuring machine of the type having a base **(10)** having an upper surface **(11)** for supporting a work piece to be measured, a bridge **(20)** having two uprights **(21, 22)** and a first member **(23)** connecting the uprights **(21, 22)** together above the upper surface **(11)** of said base **(10)**, means **(12, 13, 41)** for [moveably] *movably* mounting the bridge **(20)** to the base **(10)**, a probe **(30)**, and means **(50, 31)** for mounting said probe **(30)** to the first member **(23)** of said bridge **(20)** for movement relative to said bridge and to said base **(10)**, characterized in that:

the bridge **(20)** has a closed configuration that encircles the upper surface **(11)** of said base **(10)** said closed loop configuration formed by a second member **(24)** connecting together the uprights **(21, 22)** of the bridge **(20)** below the upper surface **(11)** of said base **(10)** and below the means **(12, 13)** for [moveably] *movably* mounting the bridge **(20)** to the base **(10)**.

Re. 33,255

ROD WEEDER ATTACHMENT FOR AN AGRICULTURAL IMPLEMENT

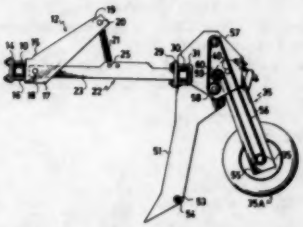
Duane C. Haukaas, Box 8, Mortlach, Saskatchewan, Canada S0H 3E0

Original No. 4,690,223, dated Sep. 1, 1987, Ser. No. 872,920, Jun. 11, 1986. Application for reissue Jan. 30, 1989, Ser. No. 302,965

Int. Cl.[5] **A01B** *39/19*

U.S. Cl. 172—44 **30 Claims**

21. A tillage attachment device for mounting on an agricultural implement of the type comprising a tool bar, ground wheels for supporting the tool bar for movement across the ground and means for causing the tool bar to move in a direction transverse to its length, the device comprising clamp means for attachment of the device to the tool bar, pivot arm means mounted on said clamp means so as to extend rearwardly therefrom including a first portion extending from said clamp means so as to be pivotal about a horizontal axis at right angles to said arm means and a second rearward portion connected to the first portion at a rearward end thereof so as to extend downwardly therefrom, spring biasing means connected between said clamp means and said first portion of said pivot arm means for biasing said arm means downwardly around said axis, a ground engaging wheel having an axle mounted on said second portion of said arm means remote from said clamp means such that the ground wheel runs on the ground rearwardly of and following said tool bar, said ground wheel having a ground engaging periphery arranged to maintain said axle at a predetermined spacing from the ground, strut means rigidly mounted upon and extending transversely to said arm means, two horizontally spaced rigid shank means each rigidly mounted on said strut means and extending downwardly therefrom for engagement with the ground, a rod extending between said shank means at respective lower ends thereof, the position of the rod relative to the ground being controlled by the height of the first portion of the arm means above the ground, bearing means mounting said rod on each of said shank means for rotation relative thereto about a longitudinal axis of said rod, and drive means for communicating drive from said ground wheel to said rod for rotating said rod, said second portion of the arm means being mounted on the first portion of the arm means such that in an operating position thereof the rod is arranged at a vertical spacing lower than the lowest point of the periphery of the ground wheel and the ground wheel controls a working depth of the rod in the ground.



Re. 33,256

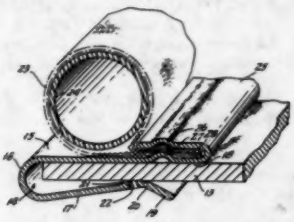
MESH-COVERED CORE STRIP FOR HIGH FREQUENCY RFI/EMI RADIATION SHIELDING

Robert B. Busby, Pawling, N.Y., assignor to Pawling Corporation, Pawling, N.Y.

Original No. 4,652,695, dated Mar. 24, 1987, Ser. No. 712,280, Mar. 15, 1985. Continuation-in-part of Ser. No. 506,010, Jun. 20, 1983, abandoned. Application for reissue Sep. 14, 1987, Ser. No. 95,874

Int. Cl.[5] **H05K** *9/00*

U.S. Cl. 174—35 GC **12 Claims**



8. An RFI/EMI shielding strip for electronic cabinets and the like, which comprises

(a) a continuous metal strip of great length in relation to its width,

(b) said strip being adapted to be mounted on the edge of a cabinet panel,

(c) a continuous core strip of resilient material extending along one side of said metal strip,

(d) a flattened, two-layer strip of circular knitted metallic mesh material extending along said core strip and wrapped around and enveloping said core strip,

(e) the width of the mesh strip being greater than the circumference of said core strip, and the opposite side edge margins of said two-layer mesh strip being brought together in face-to-face relation in four superposed layers, and

(f) means for securing said side edge margins to said continuous metal strip.

Re. 33,257

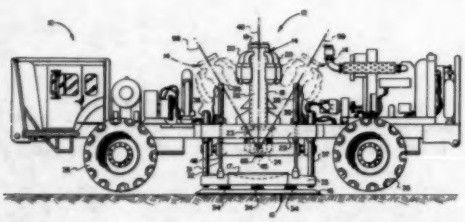
MOUNTING AND CONTROL MEANS FOR FULL WAVEFORM SEISMIC SOURCE

Tom P. Airhart, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Original No. 4,660,674, dated Apr. 28, 1987, Ser. No. 676,762, Nov. 30, 1984. Application for reissue Apr. 28, 1989, Ser. No. 345,374

Int. Cl.[5] **G01V** *1/02*

U.S. Cl. 181—113 **7 Claims**



1. Apparatus for generating combined shear and compressional waves in the earth comprising in combination:

(a) a rigid target plate positionable on the earth,

(b) an upstanding cylindrical housing having an open bottom,

(c) means for supporting said cylindrical housing above said target plate for rotation about two mutually perpendicular [horizontal] axes,

(d) an impact mass slideably interfitted with said housing for movement axially thereof,

(e) means for rotation of said housing about said axes such that the longitudinal axis of said housing lies along a selected path, and

(f) means for accelerating said impact mass downwardly to impact said target plate along said slant path.

Re. 33,258

IRRIGATING, CUTTING AND ASPIRATING SYSTEM FOR PERCUTANEOUS SURGERY

Gary Onik, San Francisco, and Leonard Ginsburg, Oakland, both of Calif., assignors to Surgical Dynamics Inc., San Leandro, Calif.

Original No. 4,678,459, dated Jul. 7, 1987, Ser. No. 633,514, Jul. 23, 1984. Application for reissue Nov. 30, 1987, Ser. No. 126,905

Int. Cl.[5] **A61B** *17/32*

U.S. Cl. 604—22 **13 Claims**

1. A surgical instrument comprising:

a housing;

a needle supported by said housing, said needle having a forward portion extending distally of said housing;

said needle including a first elongated tubular wall member defining a first bore, and having a port formed entirely within the sidewall of the forward portion of said first tubular wall member;

said needle including a second elongated tubular wall member defining a second bore sized to permit passage of tissue therethrough when said second tubular wall member is connected to a source of suction, *the passage within said second bore being unobstructed,* said second tubular wall member having a forward portion extending radially outwardly and terminating in a cutting edge;

said second tubular wall member being positioned within said first tubular wall member with said cutting edge in contact with the sidewall defining said first bore, the forward portion of said first bore adjacent said port defining a tissue receiving portion communicating with said second bore;

said first and second tubular wall members being the only tubular wall members in said forward portion of said needle;

the wall of said second tubular wall member spaced inwardly from the wall of said first tubular wall member to define the opposing walls of an annular passageway adapted to be connected to a source of irrigating fluid, said

annular passageway being the sole annular chamber in said forward portion of said needle;

said second tubular wall member being disposed for movement within said first tubular wall member to cause said cutting edge to move from a first position where tissue is drawn through said port into said tissue receiving portion of said first bore under suction to a second position where said cutting edge traverses said port to sever the tissue drawn therethrough, and to permit the severed tissue to be captured in said tissue receiving portion;

said second tubular wall member having an opening formed in its sidewall [adjacent] *extending to* said cutting edge to provide internal communication between said annular passageway and said second bore to permit direct passage within said needle of irrigating fluid between said annular passageway *and said tissue receiving portion* and said second bore;

the forward portion of the sidewall of said first tubular wall member having no opening rearward of said cutting edge of said second tubular wall member when said cutting edge is in its first position;

whereby the severed tissue is evacuated through said second bore with the aid of the irrigating fluid.

Re. 33,259

METHOD AND APPARATUS FOR RAPID NMR IMAGING OF NUCLEAR PARAMETERS WITH AN OBJECT

Lawrence E. Crooks, Richmond; John C. Hoenninger, III, Oakland; Mitsuaki Arakawa, Hillsborough, and Jerome R. Singer, Berkeley, all of Calif., assignors to The Regents of the University of California, Oakland, Calif.

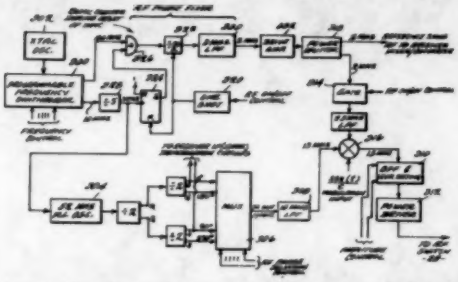
Original No. 4,471,305, dated Sep. 11, 1984, Ser. No. 331,008, Dec. 15, 1981. Continuation-in-part of Ser. No. 926,571, Jul. 20, 1978, Pat. No. 4,297,637, and Ser. No. 120,875, Feb. 12, 1980, Pat. No. 4,318,043. Application for reissue May 6, 1988, Ser. No. 191,025

Int. Cl.[5] **G01R** *33/20*

U.S. Cl. 324—309 **46 Claims**

40. A method as in claim 39 including the step of generating r.f. reference signals for use in said r.f. receiving step subse-

quent to at least selected ones of said pulses, and including the step of accurately resetting the relative phase of said r.f. refer-



ence signals at the termination of or subsequent to said selected ones of said pulses.

Re. 33,260

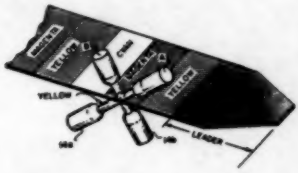
THERMAL PRINTER COLOR DYE FRAME IDENTIFICATION USING RED AND YELLOW LIGHT SOURCES

Stanley W. Stephenson, Spencerport, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Original No. 4,710,781, dated Dec. 1, 1987, Ser. No. 892,620, Aug. 4, 1986. Application for reissue May 2, 1988, Ser. No. 189,554

Int. Cl.[5] G01D *15/10*; B41J *3/20*

U.S. Cl. 346—76 PH **6 Claims**



4. In a thermal printer system including a printer which uses a carrier with a repeating series of spaced different colored dye frames, and a receiver which receives dye from the color frames of the series to form a colored image, means for moving the carrier and the receiver along respective paths so as to sequentially move each dye frame of a series and the receiver so that dye from each dye frame of a series is transferred to the receiver and forms a colored image in the receiver, means for identifying dye frames of such series comprising:

(a) a low frequency LED disposed adjacent to the carrier path for illuminating the carrier with low frequency light;

(b) a high frequency LED disposed adjacent to the carrier path for illuminating the same dye frame of the carrier illuminated by low frequency light with high frequency light;

(c) first and second spaced photodetectors disposed adjacent to the carrier path and respectively responsive to the intensity of light which passes through the dye frames for respectively providing electrical signals, the levels of such signals being a function of the intensity of source light which passes through a dye frame and representing logic patterns; and

(d) means responsive to the logic patterns of the electrical signals produced by such first and second photodetectors for identifying a particular dye frame being illuminated by the light sources.

Re. 33,261

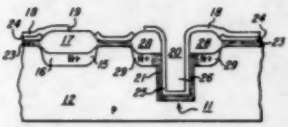
TRENCH CAPACITOR FOR HIGH DENSITY DYNAMIC RAM

David A. Baglee, Albuquerque, N. Mex., and Ronald Parker, Houston, Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Original No. 4,721,987, dated Jan. 26, 1988, Ser. No. 627,372, Jul. 3, 1984. Application for reissue Mar. 2, 1989, Ser. No. 319,783

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.6 **14 Claims**



8. A dynamic memory cell formed in a face of a semiconductor body, said cell comprising:

an access transistor having a source-to-drain path at a channel area of said face, and a gate over said channel area separated therefrom by a thin gate oxide;

a bit line including an elongated N+ region of said face, the drain of said transistor being an edge of said N+ region;

a word line extending along said face perpendicular to said bit line, said gate being a part of said word line;

said N+ region of said bit line being insulated from said word line by thick thermal field oxide overlying said bit line;

a capacitor area at said face including a trench etched into said face and N+ region surrounding said trench, with a thick thermal field oxide overlying said N+ region;

a region of thermal field oxide encircling said trench inset into said N+ region surrounding said trench, a field plate including a conductive layer covering said face overlying said capacitor area, said bit line and all areas except said channel area of said transistor, and extending down into said trench to provide the capacitor, insulated from the silicon in said trench by a thin oxide.

PLANT PATENTS

GRANTED JULY 10, 1990

Illustrations for plant patents are usually in color and therefore it is not practicable to reproduce the drawing.

7,264

ROSE PLANT NAMED 'VEROLWEK'

O. L. Weeks, 12610 Central Ave., Ste. 76, Chino, Calif. 91710, assignor to O. L. Weeks, Chino, Calif.

Filed Jan. 31, 1989, Ser. No. 304,490
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—15 1 Claim

1. A new and distinct variety of rose plant of the hybrid tea rose class, substantially as shown and described, characterized particularly by relatively large, attractive, yellow flowers.

7,265

SWEET JENNY

William G. Ison, Rte. 1, Box 19, Hwy. 19, Brooks, Ga. 30205

Filed Mar. 10, 1988, Ser. No. 166,245
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—47 1 Claim

1. The new and distinct variety of grape plant as described and illustrated.

7,266

PINEAPPLE

William G. Ison, Rte. 1, Box 19, Hwy. 19, Brooks, Ga. 30205

Filed Mar. 10, 1988, Ser. No. 166,243
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—47 1 Claim

1. The new and distinct variety of the grape plant as described and illustrated.

7,267

SUPREME

William G. Ison, Rte. 1, Box 19, Hwy. 19, Brooks, Ga. 30205

Filed Mar. 11, 1988, Ser. No. 167,324
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—47 1 Claim

1. The new and distinct variety of grape plant as described and illustrated.

7,268

JANEBELL

William G. Ison, Rte. 1, Box 19, Hwy. 19, Brooks, Ga. 30205

Filed Mar. 10, 1988, Ser. No. 166,247
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—47 1 Claim

1. The new and distinct variety of grape plant as described and illustrated.

7,269

CHRYSANTHEMUM PLANT NAMED MAROON PRIDE

Richard E. Widmer, St. Paul, Minn., assignor to Regents of the University of Minnesota, Minneapolis, Minn.

Filed Nov. 21, 1988, Ser. No. 274,010
Int. Cl.[5] A01H *5/00*
U.S. Cl. Plt.—82 1 Claim

1. A new and distinct *Dendranthema grandiflora* cultivar substantially as shown and described herein, and particularly characterized by blooms which are reliably early, 7.5–9.0 cm in diameter, dark red, slow-fading double florets of decorative form, presented in open spray formation on uniform, medium high, mounded plants of moderate sturdiness and strength, with small to medium sized foliage.

PATENTS

GRANTED JUL. 10, 1990

ERRATA

For CLASS	See PATENT NO.
475-233	4,939,953
475-278	4,939,955
505-001	4,939,976
073-118	4,939,985
101-348	4,939,994
110-233	4,940,010
114-267	4,940,021
128-715	4,940,023
123-090	4,940,048
015-321	4,940,082
181-145	4,940,108
229-001	4,940,189
229-122	4,940,190
229-125	4,940,191
272-130	4,940,233
206-037	4,940,250
250-236	4,940,310
366-075	4,940,329
411-432	4,940,377
425-133	4,940,403
446-208	4,940,451
106-494	4,940,492
148-023	4,940,498
427-047	4,940,596
558-388	4,940,780
428-034	4,940,820
524-510	4,940,841
505-001	4,940,842
264-065	4,940,843
521-116	4,940,844
435-134	4,940,845
427-385	4,940,846
156-089	4,940,847
156-307	4,940,848
428-209	4,940,849
209-580	4,940,850
501-056	4,940,851
523-211	4,940,852
435-240	4,940,853
428-411	4,940,854
361-119	4,941,063
378-099	4,941,169
381-086	4,941,187
367-165	4,941,202

PATENTS

GRANTED JULY 10, 1990

GENERAL AND MECHANICAL

4,939,794

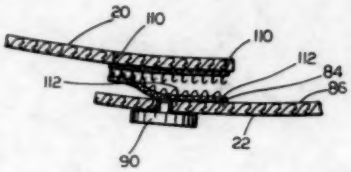
ADJUSTABLE NECK AND CUFF CLOSURES FOR DRESS SHIRTS

Herbert R. Aronson, New York, N.Y., assignor to Salant Corporation, New York, N.Y.

Filed Nov. 25, 1988, Ser. No. 275,961

Int. Cl.[5] A41B *3/00, 7/00*; A41F *1/00*

U.S. Cl. 2—128 **5 Claims**



1. An adjustable closure for overlapping portions of a garment, comprising:

(A) closure means for continuously adjustably overlapping and fastening an outer garment portion over and to an inner garment portion, including

(i) a first, flexible fabric sewn on an inner surface of the outer garment portion, and having first fastening means extending lengthwise along the first fabric,

(ii) a second, flexible fabric sewn on an outer surface of the inner garment portion, and having second fastening means extending lengthwise along the second fabric,

(iii) said first and second fastening means facing and engaging each other when the outer garment portion overlaps the inner garment portion to a desired variable extent selected by a wearer, and is pressed against the inner garment portion, and

(iv) said first and second fastening means disengaging each other when the outer garment portion is peelably removed from the inner garment portion, and

(b) a dress button sewn on an outer surface of the outer garment portion to simulate the appearance of a conventional garment closure button used for fastening outer and inner garment portions together, said dress button constituting no part of said closure means which is solely responsible for fastening the outer and inner garment portions together, at least one of said first or second fabric being sewn on said garment only over a portion of its length, whereby the remaining portion is free to move relative to said garment.

4,939,795

METHOD OF ISOLATING A PRODUCT IN A PASSIVE DOSING DISPENSER BY TRAPPING INTERNALLY-GENERATED GAS BUBBLE

Stephen H. Iding, and Robert S. Dirksing, both of Cincinnati, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Division of Ser. No. 618,622, Jun. 8, 1984, abandoned. This application Sep. 28, 1987, Ser. No. 101,466

Int. Cl.[5] E03D *9/03*

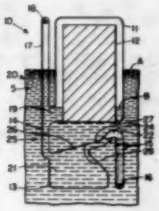
U.S. Cl. 4—228 **20 Claims**

1. A method of isolating a product in a dispenser from a body of liquid, said dispenser including an internal reservoir and means for establishing fluid communication between said internal reservoir and said body of liquid, said fluid communication means including an inverted U-shaped section, said method comprising the steps of:

(a) partially immersing said dispenser in said body of liquid whereby a portion of said liquid flows into said internal reservoir and dissolves a portion of said product to form a solution, said inverted U-shaped section being bridged by a continuum of liquid/solution when said flow ceases;

(b) generating a plurality of gas bubbles in said solution;

(c) directing at least a portion of said gas bubbles to said inverted U-shaped section; and



(d) trapping said at least a portion of said gas bubbles in said inverted U-shaped section, thereby establishing a gas lock thereacross and isolating said product from said body of liquid.

4,939,796

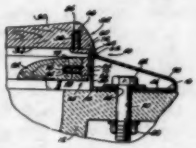
TOILET SEAT HINGE

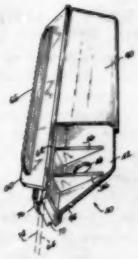
Kenneth V. Pepper, Plymouth, Wis., assignor to Bemis Manufacturing Company, Inc., Sheboygan Falls, Wis.

Filed Oct. 19, 1988, Ser. No. 260,006

Int. Cl.[5] A47K *13/12*

U.S. Cl. 4—236 **16 Claims**





3. A toilet assembly comprising a toilet bowl, a member

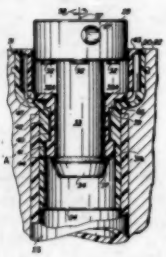
having a rearward end including therein a slot, a hinge including a hinge post portion connected to said toilet bowl, and a hinge leaf portion connected to said hinge post portion for pivotal movement relative thereto and including a projection extending into said slot, and connecting means for securing said projection on said hinge leaf portion in said slot in said member and comprising a substance adhesively secured to said member and mechanically interlocked with said projection.

4,939,797

WATER DELIVERY ASSEMBLY FOR CLEANING SWIMMING POOLS

John M. Goettl, Phoenix, Ariz., assignor to Sally Ghiz, Phoenix, Ariz.

Filed Mar. 29, 1989, Ser. No. 330,195
Int. Cl.[5] E04H *3/20*; B05B *3/00, 15/10*
U.S. Cl. 4—490 **13 Claims**



1. A water delivery assembly for cleaning the inner surfaces of a swimming pool, said assembly comprising:

inlet pipe means for introducing water under pressure into said pool,

a housing in fluid communication with said inlet pipe means, said housing having an outer open end communicating with the interior of said swimming pool and an inner open end fixedly attached to said inlet pipe;

a water delivery head retainer removably locked to the interior of said housing;

a water delivery head comprising a nozzle and a stem portion attached thereto, said nozzle having at least one water aperture therein to project a pressurized stream of water in adjacent parallel and scrubbing relation to the inner surface of said pool, said delivery head being mounted in said retainer and adapted for reciprocal motion therewithin to an extended operative position and a retracted inoperative position;

said water delivery head responsive to the application of pressurized water to said housing for extending to said extended operative position; said head also responsive to the removal of pressure from the water in said housing for retraction to said retracted inoperative position;

annular shoulder means located at the lower end of the stem portion of said delivery head;

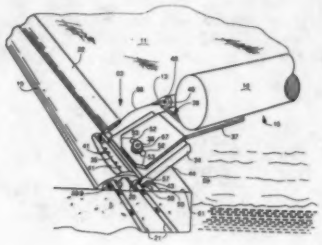
and stop means located on the interior of said housing, cooperating with said annular shoulder means to provide the upper limit of extension of said delivery head; said stop means being located in the bottom part of said housing and adjacent the point where the housing is attached to said inlet pipe, whereby the stop impact caused at said point produces minimum bending moment of stress force on said housing.

4,939,798

LEADING EDGE AND TRACK SLIDER SYSTEM FOR AN AUTOMATIC SWIMMING POOL COVER

Harry J. Last, 1246 Birchwood Dr., Sunnyvale, Calif. 94089

Filed Oct. 17, 1988, Ser. No. 258,000
Int. Cl.[5] E04H *3/19*
U.S. Cl. 4—502 **50 Claims**



1. A leading edge and track slider mechanism for carrying a front edge of a flexible cover above a liquid contained in a pool as the cover, winding and unwinding from a cover drum located at one end of the pool, is drawn back and forth across the pool comprising, in combination,

(I.) a rigid structural boom spanning the pool having a planer longitudinal surface with a "C" channel along one edge of the planer surface for receiving and capturing a front beaded edge of the pool cover,

(II.) a pair of rigid sliders each captured and sliding within a "C" channel of a pool cover track located along a side edge of the pool;

(III.) attachment means extending from the planer longitudinal surface of the boom at it's ends for establishing a translating and pivoting coupling between the ends of the boom and the sliders,

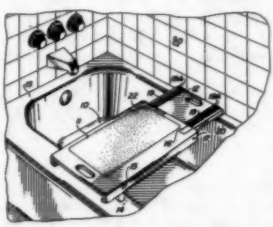
(IV.) means for anchoring each slider to a cable extending from a beaded tape secured to side edges of the pool cover proximate the cover's front corners, each beaded tape edge being captured and sliding within the same "C" channel of the track as a slider, the cables extending from the respective sliders to connect with and wind around at least one rotatable cable take-up reel.

4,939,799

PORTABLE, TRAVELER'S BATH SEAT

Brian V. Van Hovel, Phoenix, Ariz., assignor to At Ease Enterprises, Inc., Phoenix, Ariz.

Filed Apr. 28, 1989, Ser. No. 344,677
Int. Cl.[5] A47K *3/022, 3/12*
U.S. Cl. 4—578 **15 Claims**



1. In apparatus having means for supporting a person on and above a bathtub whereby a person may sit above a tub to bathe and shower, the improvement comprising:

first and second spanning supports, said first spanning support being a carrying case in which said second spanning support is housed for storage and transport;

adjustment means for adjustably coupling said first spanning support to said second spanning support to form a coupled combination such that the elongate dimension of the coupled combination may be minimized for ease of transport and extended to span across a bathtub for seating thereon;

means coupled to at least one of said first and second spanning supports for inhibiting movement of the coupled combination of said first and second support, in a direction along the elongate axis of said combination when said combination is emplaced spanning a bathtub; and

said means for inhibiting movement of said coupled combination comprises a locking leg pivotally coupled to at least one of said first and second spanning supports and extending downward adjacent an inner, non-wall-adjacent side of a tub across which said coupled combination is spanned.

4,939,800

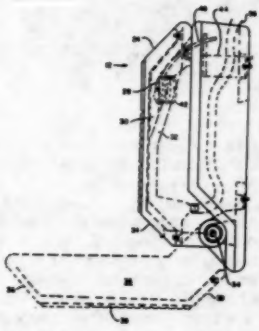
EYE WASH STATION

Frank S. Florentino, Thousand Oaks, and Douglas M. Patton, Irvine, both of Calif., assignors to McKesson Corporation, San Francisco, Calif.

Continuation of Ser. No. 64,918, Jun. 19, 1987, abandoned. This application Dec. 21, 1988, Ser. No. 289,491

Int. Cl.[5] A61H *33/00*

U.S. Cl. 4—620 **4 Claims**



1. An eye wash station comprising:

(a) normally enclosed basin housing means including a base member adapted to be disposed in a normally upright position and a basin mounted to said base member for pivoting between a closed position generally parallel to said base member and a second operable position transverse to said base member,

(b) spray nozzle means mounted to said basin adapted to spray liquid upwardly when said basin is in an operable position,

(c) an eye wash feed tank having an outlet opening and disposed within said basin housing means, and

(d) liquid conduit means providing communication between said feed tank outlet openings and said spray nozzle means, said feed tank being removable from said basin housing means, said base member including a receptacle communicating with said liquid conduit means for seating the outlet opening of said feed tank so that an air inlet opening is provided, said spray nozzle means being above said air inlet opening with said base member and said basin in upright positions and being below said air inlet opening when said basin is pivoted to an operable position.

4,939,801

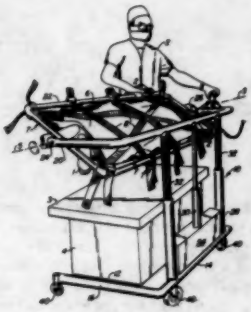
PATIENT TRANSPORTING AND TURNING GURNEY

Gary A. Schaal, and Diana L. Schaal, both of 11677 Hill Rd., Marysville, Calif. 95901

Filed Dec. 22, 1988, Ser. No. 288,650

Int. Cl.[5] A61G *7/00*

U.S. Cl. 5—61 **9 Claims**



1. A gurney for moving a hospital patient between a hospital bed having widely spaced supporting legs and an operating table supported from a central pedestal base, said gurney comprising:

a base, said base being horizontally disposed and U-shaped, said U-shaped base having spaced apart protruding arms connected by a central member, said spaced apart arms adapted to fit under and between the supporting legs of the hospital bed and straddle around the outside of the central pedestal base of the operating table;

said base supporting a plurality of wheels whereby said base can be rolled from support underneath the hospital bed to support around the central pedestal base of the operating table;

a stretcher support;

means for supporting said stretcher support from said base including a lifting ram connected to the base at the lower end and to the stretcher to support at the upper end whereby the stretcher support may be raised and lowered with respect to the base;

a stretcher frame elongate about a central longitudinal axis, said stretcher frame disposed for surrounding and supporting a patient within said stretcher frame;

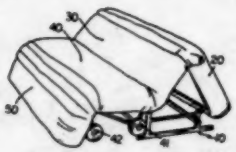
means for rotatably connecting said stretcher frame to said stretcher support at the longitudinal axis of said stretcher frame, said means for rotatably connecting said stretcher frame to said stretcher support permitting the rotating of said frame about said longitudinal axis between distal ends of said stretcher support;

first and second tensile sheet members for being disposed on said patient at opposite sides of said patient, each said tensile sheet member being sufficiently strong to support said patient from said stretcher frame under tension;

first means for detachably supporting under adjustable tension one of said tensile sheet members form said stretcher frame;

second means for detachably supporting under adjustable tension said second tensile sheet embers from said stretcher frame whereby the patient is secured between said first and second tensile sheet members is trapped to said stretcher frame for rotation with said stretcher frame.

4,939,802
SOFA-BED
Percival Lafer, Rua Garcia Lorca, 301, Sao Bernard do Campo-SP, Brazil
Filed Dec. 30, 1988, Ser. No. 292,229
Claims priority, application Brazil, Dec. 30, 1987, 8707241
Int. Cl.[5] A47C 17/17
U.S. Cl. 5—37 C 23 Claims



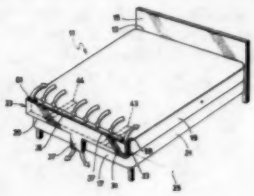
1. A SOFA-BED comprising a basic structure (10) defined by two lateral, parallel portions (11, 15) rearwardly interconnected to each other by means of a removable crossbeam (14); a back including a front portion (30) and a rear portion (20) articulated to each other by means of a pair of adjacent upper edges, the rear portion (20) having a lower extreme edge articulate to the structure (10); a seat (40) having a rear edge articulated to a lower extreme edge of the front back portion (30), and having a front edge articulated to an upper edge of a footrest (50), the seat (40) being supported on a pair of rear rollers (41) and a pair of front rollers (42) so as to be horizontally displaceable between a "sofa" condition, with the rollers (41, 42) positioned between the lateral portions of the basic structure (10) and the front (30) and rear (20) portions of the back maintained in a raised position, and a "bed" condition, with the rollers displaced forward of the basic structure (10) and with the front and rear back portions and the footrest (50) arranged horizontally coplanar with the seat portion (40), the pair of front rollers (42) being assembled on front stems (42a) articulated by an upper portion thereof to the seat (40) and also articulated in a middle portion thereof to the footrest (50) by means of a small stem (52) so as to be displaced between a rear position an a front position by an articulation of said front stems (42a) to seat (40) when the latter is displaced between the "sofa" condition and the "bed" condition, said seat occupying a horizontal position in the "bed" condition and being supported on the floor by means of the two pairs of rollers (41, 42), being raised the footrest (50) into the horizontal position by a long, rigid stem (51) having a front end articulated to the footrest (50) and a rear end articulated to an extension (31) of the front portion of the back (30) that projects downwards from the articulation axis of that back portion with seat (40), said back portions, the seat and the footrest being lined with a layer of flexible material (80, 90).

4,939,803
STRETCHER COVER
Phillip N. Waters, 102 Flint Ridge Apts., Bldg. 5, Hillsborough, N.C. 27278
Filed Aug. 31, 1989, Ser. No. 401,028
Int. Cl.[5] A47C 29/00
U.S. Cl. 5—414 8 Claims

1. A stretcher cover, comprising:
(a) a flexible cover piece having an enlarged first end and a second end smaller than said first end, said cover piece having:
(i) a stretcher insertion pocket at said first end comprising two spaced parallel layers of material;
(ii) a plurality of support structure holders extending across said first end;
(iii) a means for securely holding the second end to a stretcher; and
(iv) a plurality of flap-covered opening areas on said cover piece; and

(b) a flexible support structure insertable in said support structure holders.

4,939,804
BED VENTILATING APPARATUS AND METHOD
William N. Grant, 8301 Forrest Oak Dr., Fort Worth, Tex. 76180
Filed Jul. 24, 1989, Ser. No. 384,561
Int. Cl.[5] A47C 21/04
U.S. Cl. 5—468 10 Claims



1. An apparatus for ventilating a bed in a room, the bed having a head, a foot, and a mattress positioned above a box spring, the apparatus comprising:
an elongate housing having an upper extent and a lower extent and having a longitudinal axis which is positionable parallel to the foot of the bed, the upper extent of the elongate housing being provided with at least one air inlet opening for receiving stale air, the elongate housing also having an outlet duct for exhausting air into the room;
at least one mounting flange extending outwardly from the elongate housing generally perpendicular to the longitudinal axis thereof, the mounting flange being adapted to be received between the mattress and box spring for supporting the elongate housing on the bed;
filtration means located between the air inlet opening to the elongate housing and the outlet duct for filtering the stale air entering the housing;
at least one recirculating duct associated with the elongate housing for recirculating filtered air from the elongate housing back to the bed; and
fan means for drawing air through the air inlet opening, for exhausting filtered air out the outlet duct and for recirculating a portion of the filtered air through the recirculation duct.

4,939,805
HEEL LASTER
William Walega, Hollis, N.H., assignor to International Show Machine Corporation, Nashua, N.H.
Filed Jun. 13, 1989, Ser. No. 365,396
Int. Cl.[5] A43D 21/16, 21/00
U.S. Cl. 12—10.5 11 Claims

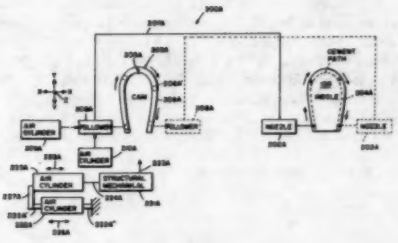
1. A heel laster to receive a footwear upper assembly that includes a last, a footwear upper draped about the last and an

insole disposed on the last bottom, said heel laster being constructed to press and form the heel part of the footwear upper assembly about the heel and side parts of the last while leaving a margin that extends outwardly from the insole, forming of the heel part being effected in part by a heel pad, said heel laster comprising:

a spindle and toe support to receive the upper assembly and means to achieve mechanical attachment of the last to the heel laster and the toe support thereof;

means to press the last firmly onto the spindle and the toe support; and

mechanical means to apply a bead of adhesive ribbon onto the insole in the heel part thereof, said mechanical means comprising a nozzle and a mechanical tracer mechanism to position the nozzle appropriately with respect to the



insole and guide the nozzle along an appropriate adhesive applicator path, said mechanical tracer mechanism comprising a pivotally angularly adjustable U-shaped cam track in an X-Y plane, a linkage which is substantially parallel to said insole at the heel part thereof connected to the nozzle at one end thereof and to a cam follower at the other end thereof such that the cam follower is positioned within the cam track, means connected to propel the cam follower along the track in the X-Y plane, said mechanical tracer mechanism, as a unit, having a predetermined and fixed position relative to the heel pad of the heel laster so as to establish exact longitudinal position of the last to the footwear upper assembly irrespective of last pin position; and

means comprising wipers operable to wipe the margin onto the insole whereby the margin is adhered to the insole.

4,939,806

POOL CLEANER

Carl F. W. Supra, Johannesburg North, South Africa, assignor to Liberty Pool Products S.A., Geneva, Switzerland

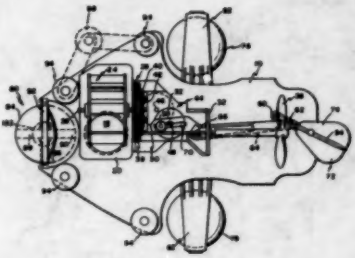
Continuation-in-part of Ser. No. 153,201, Feb. 8, 1988, Pat. No. 4,849,024, and a continuation-in-part of Ser. No. 307,048, Feb. 7, 1989. This application Mar. 2, 1989, Ser. No. 317,845

Claims priority, application South Africa, Jan. 7, 1988, 88/0083; Jan. 14, 1988, 88/0237; Jan. 19, 1988, 88/0327; Apr. 13, 1988, 88/2571; Apr. 13, 1988, 88/2572

Int. Cl.[5] E04H *3/20*

U.S. Cl. 15—1.7 **8 Claims**

1. A device for cleaning a surface which is submerged in a liquid, the device including: a head having at least one inlet which opposes the surface to be cleaned, means for connecting the head to a suction source to cause liquid to flow through the inlet, turbine means which is driven by the flowing liquid, propellor means which is driven by the turbine means and which propels the head over the surface to be cleaned, and steering means for altering the direction in which the head is propelled over the surface to be cleaned, the steering means including at least one rudder and control means, actuated by



the turbine means, for changing the orientation of the rudder relatively to the head.

4,939,807

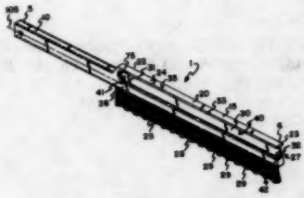
SNOW REMOVAL DEVICE

Edward T. Henes, 812 10th St., Fargo, N. Dak. 58103

Filed Dec. 1, 1988, Ser. No. 278,582

Int. Cl.[5] A47L *1/06*

U.S. Cl. 15—111 **19 Claims**



1. A snow removal device comprising:

(a) an elongate snow removal body member having first and second opposite ends, and plowing means;

(i) said plowing means including a longitudinal recessed channel portion having first and second ends and extending generally parallel to a longitudinal extension of said body member;

(ii) said snow removal body member further including first and second face portions generally parallel and spaced apart, said first face portion defining a generally concave plowing member of said plowing means;

(iii) said plowing means further including a snow-stopping portion proximate said first end of said snow removal body member, said snow-stopping portion closing said first end of said channel portion; and,

(iv) said plowing member including: an edge portion; a first curved portion adjacent said edge portion; a back wall portion adjacent said curved portion; and, a second curved portion adjacent said back wall portion; and,

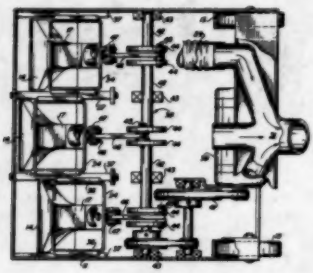
(b) an elongate handle portion oriented proximate said first end of said snow removal body member and extending generally coplanar with said elongate snow removal body member.

4,939,808

CARPET CLEANING APPARATUS

James R. Roden, Phoenix, Ariz., and Gary D. Ingle, Mound, Minn., assignors to Professional Chemicals Corporation, Chandler, Ariz.

Filed Jan. 22, 1990, Ser. No. 468,177
Int. Cl.[5] A47L 11/30
U.S. Cl. 15—322 10 Claims



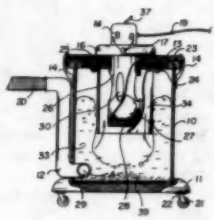
1. Carpet cleaning apparatus adapted to be moved across a carpet along a preferred path of travel, first and second vacuum nozzles having elongated inlet openings extending substantially normal to said preferred path of travel, means supporting said first and second vacuum nozzles for reciprocating movement along paths substantially parallel to said preferred path of travel, means for propelling said vacuum nozzles along their paths with the movement of said vacuum nozzles being out of phase with each other, and cleaning fluid discharge means associated with said vacuum nozzles.

4,939,809

TANK TYPE LIQUID VACUUM CLEANER

Chul Park, 1837 Green Place Ter., Rockville, Md. 20850

Filed May 1, 1989, Ser. No. 345,574
Int. Cl.[5] A47L 5/36
U.S. Cl. 15—328 7 Claims



1. A tank type liquid vacuum cleaner which passes dirty air over a surface of a liquid which comprises:

a liquid tank containing liquid, said liquid tank being supported on a supporting plate having a plurality of rollers,

an air inlet having an L-shaped end at the one end thereof for inserting into a lower portion of said liquid tank for forcefully mixing air with the liquid, said air inlet connected to an intake hose at the other end thereof,

a tank cover slidably and tightly attached to said liquid tank,

an anti-overflow cylinder suspended by said tank cover,

a ball valve containing tube disposed within said anti-overflow cylinder, said ball valve containing tube including a plurality of apertures disposed in the middle portion thereof, a ball valve seat closed at a lower outlet for seating a ball valve on the ball valve seat, and an upper outlet thereof extending to a vent opening,

a fan housing including a fan, said fan housing containing said vent opening disposed in a side wall thereof,

a motor connected to an electric source for actuating said fan, and

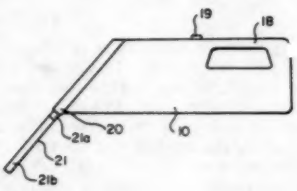
a three-stage switch connected to said motor, wherein the three-stage switch includes an off position, a low power position, and a high power position, for actuating the off-switch, and for operatively selecting a vacuum cleaner or an air cleaner, whereby the vacuum cleaner can be converted to an air cleaner to effectively clean dirty air, and prevents the liquid from spilling on the floor when the cleaner is overturned.

4,939,810

PORTABLE VACUUM CLEANER

Yasukazu Ataka, Ibaragi, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 18,854, Feb. 24, 1987, Pat. No. 4,704,765, which is a continuation of Ser. No. 703,898, Feb. 21, 1985, abandoned. This application Aug. 3, 1987, Ser. No. 80,976
Claims priority, application Japan, Jun. 11, 1984, 59-87247[U]; Jun. 14, 1984, 59-89905[U]; Jun. 14, 1984, 59-89909[U]; Jun. 15, 1984, 59-89647[U]; Jun. 22, 1984, 59-9434[U]; Jul. 9, 1984, 59-104258[U]
Int. Cl.[5] A47L 5/24
U.S. Cl. 15—347 8 Claims



1. A portable vacuum cleaner comprising

a housing having a front end, a back end and a bottom surface, said front end being formed with a suction inlet having an opening, the surface defining said opening being no higher than said bottom surface,

a dust collecting means inside said housing,

a suction-generating means behind said dust collecting means inside said housing, and

an accessory piece which is removably attachable to said suction inlet and is L-shaped as a whole, said accessory piece comprising a base part which is detachably engagable to said suction inlet and a flat suction pipe part which is disposed on one side of said base part, said flat suction pipe part including an expandable bellows-like section.

4,939,811

FLOOR POLISHER WITH A DUST COLLECTING DEVICE

Akira Matunaga; Hideo Inoue; Ken Ikezawa, and Tetu Arai, all of Shizuoka, Japan, assignors to Amano Corporation, Yokohama, Japan

Filed Dec. 12, 1988, Ser. No. 284,059
Claims priority, application Japan, Dec. 14, 1987, 62-315663
Int. Cl.[5] A47L 11/20
U.S. Cl. 15—385 1 Claim

1. A floor polisher with a dust collecting device, comprising:

a disc-shaped buffing pad rotatable about a center axis;

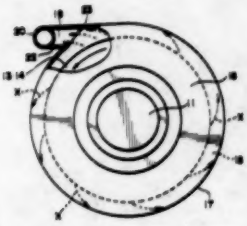
a motor connected to said buffing pad for rotating said buffing pad at a high speed;

a circular cover member spaced above and covering the upper surface of said buffing pad;

a skirt depending from the peripheral edge of said cover member to the level of the bottom of said buffing pad and circumferentially encircling a space below said cover member and within said skirt and having a dust discharging opening therein;

a dust collecting device for exerting a suction on said space; and

a guide chamber extending outwardly of said skirt from said dust discharging opening and having a radially outer wall



extending from said skirt on a line tangent to said skirt, a top wall extending from said cover, a radially inner wall spaced inwardly from and parallel to said outer wall, and an inclined bottom wall inclined upwardly from the position of the lower edge of said skirt at said dust discharging opening and in a direction parallel with said inner and outer walls, said guide chamber having an outlet port at the end remote from said dust discharging opening and communicating with said dust collecting device.

4,939,812

EXTERNAL DOOR HANDLE FOR A MOTOR VEHICLE

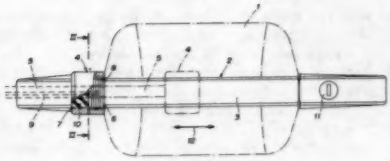
Karl-Heinz Bauer, Gärtringen, Fed. Rep. of Germany, assignor to Daimler-Benz AG, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 279,561

Claims priority, application Fed. Rep. of Germany, Dec. 4, 1987, 3741094

Int. Cl.[5] E05B *1/00*

U.S. Cl. 16—110 R **10 Claims**



1. An outside vehicle door handle means for opening a vehicle door comprising:

a strap which has a user gripping zone;

the strap is attached to the outside of the vehicle door and is formed with an approximately uniform cross-sectional profile along its longitudinal direction;

a displaceable slide means is provided and has portions which are arranged over the periphery of the strap for at least one of touching, scraping and brushing the gripping zone of the strap as the slide means is displaced along the strap to remove filth that has accumulated on the strap.

4,939,813

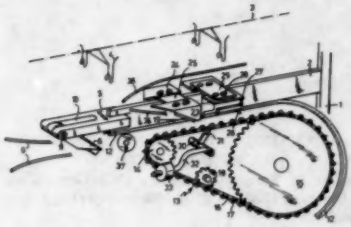
APPARATUS FOR REMOVING THE LEGS FROM BACK PORTION OF POULTRY

Jacobus E. Hazenbroek, Burg de Zeeuwastraat 52, Numansdorp, Netherlands

Continuation-in-part of Ser. No. 304,542, Jan. 31, 1989, Pat. No. 4,896,399. This application Nov. 8, 1989, Ser. No. 433,148

Int. Cl.[5] A22C *21/00*

U.S. Cl. 17—11 **28 Claims**



1. An apparatus for removing the legs and thighs from the back portion of poultry of which the breast portion has already been removed, comprising a suspension conveying system with a series of spaced shackles interspaced at regular intervals from which the poultry carcasses to be processed can be suspended upside down by their legs, and a processing station mounted at a level below the conveyor and comprising blades for separating the thighs from the back of the carcass, characterized in that the processing station (13) comprises a gripper member for gripping the back portion (8) of a poultry carcass and carrying the back portion along a path diverging from the path of the legs as the legs are carried by the overhead conveying system at a higher speed than that of the suspension conveyor (3), and a guide plate (12) adjacent the gripper member for maintaining the back portion (8) in the diverging path so that the back becomes removed from the thighs.

4,939,814

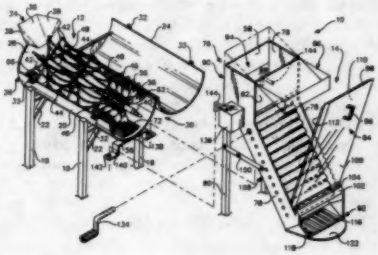
CULTURED MUSSEL CLEANING MACHINE

Diana R. Tillion, P.O. Box 6409, Halibut Cove, Ak. 99603

Filed Nov. 17, 1989, Ser. No. 438,579

Int. Cl.[5] A22C *29/04*

U.S. Cl. 17—74 **20 Claims**



1. A cultured mussel cleaning machine for cleaning fragile-shelled mussels, the machine comprising:

means for containing a plurality of fragile-shelled mussels and water, said containing means having an inlet into which the mussels are placed and an outlet through which the mussels exit;

means for agitating the mussels, said agitating means being positioned adjacent to and downstream from said inlet to

break apart mussels clumped together and to remove unwanted material from the mussel shells;

means for brushing and rolling the mussels to remove additional unwanted material from the exterior of the mussels, said brushing and rolling means being positioned downstream from said agitating means; and

means for scrubbing the mussels, said scrubbing means being positioned downstream from said brushing and rolling means and adjacent said outlet.

4,939,815

LAP EVENING APPARATUS FOR A FIBER PROCESSING MACHINE

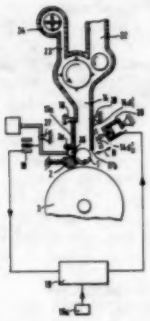
Ferdinand Leifeld, Kempen, Fed. Rep. of Germany, assignor to Trützschler GmbH & Co. KG, Mönchengladbach, Fed. Rep. of Germany

Filed Oct. 11, 1988, Ser. No. 255,258

Claims priority, application Fed. Rep. of Germany, Oct. 9, 1987, 3734140

Int. Cl.[5] D01G *23/04*

U.S. Cl. 019—105 **14 Claims**



1. In a textile fiber feeder including

a feed chute adapted to be charged with fiber material, said feed chute having a width, a lower portion constituting a zone in which a fiber lap is formed from the fiber material and an outlet opening through which the fiber lap is discharged; said outlet opening being situated in said zone;

measuring means for measuring a distribution of the fiber material along the feed chute width and for generating signals representing said distribution;

said measuring means including a sensor member directly responding to said distribution of fiber material;

means for generating an air flow in the feed chute for affecting said distribution of the fiber material and causing densification thereof;

means defining air outlet openings in said feed chute in said zone for guiding said air flow out of said feed chute; and

regulating means for controlling the air flow along the feed chute width as a function of said signals; said regulating means including a movably supported setting member and force-exerting means connected to said setting member for changing the orientation thereof in response to a change of said signals, whereby said air flow is directly altered by said setting member as a function of said signals;

the improvement wherein said sensor member and said setting member are arranged in an adjoining relationship in said zone.

4,939,816

CONTROL APPARATUS FOR CONTROLLING FLOCK HEIGHT IN A FEED CHUTE FOR A FIBER PROCESSING MACHINE

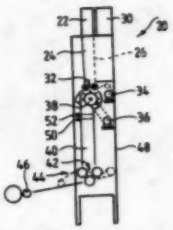
Thomas Schenkel, Effretikon, and Urs Staehli, Turbenthal, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Apr. 13, 1988, Ser. No. 181,074

Claims priority, application Switzerland, Apr. 13, 1987, 01455/87

Int. Cl.[5] D01G *23/06*

U.S. Cl. 19—105 **29 Claims**



1. In combination

a feed chute for a fiber processing machine including an infeed chute for receiving fiber blocks, forwarding means for forwarding fiber flocks from said infeed chute and a main chute for forming a flock column of the fiber flocks forwarded from said infeed chute; and

a control means for controlling said forwarding means in dependence upon the flock column in said main chute, said control means including first means for defining a set height of the fiber column in said main chute, a plurality of sensors distributed along a vertical line and adapted to react to the material in an operating region adjacent thereof, an interrogation device for interrogating said sensors in sequential manner to obtain a signal indicative of the height of the flock column, and second means for determining a magnitude of a deviation of the indicated height of the fiber column from said set height, said second means being connected to said forwarding means to control said forwarding means in response to a determined magnitude of deviation to eliminate the deviation.

4,939,817

PROCESS AND DEVICE FOR SEPARATING A SULFUR-LYE SUSPENSION

Guenter Weber, Linden, Fed. Rep. of Germany, assignor to Linde Aktiengesellschaft, Wiesbaden, Fed. Rep. of Germany

Filed Jun. 26, 1987, Ser. No. 66,598

Claims priority, application Fed. Rep. of Germany, Jun. 26, 1986, 3621481

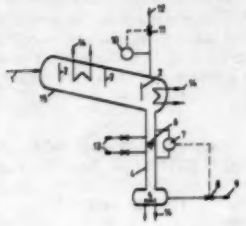
Int. Cl.[5] C01D *3/20*

U.S. Cl. 23—308 S **22 Claims**

1. In a process for separating sulfur from a sulfur-lye suspension, the sulfur-lye suspension is fed into a separation tank, the temperature inside the separation tank is maintained above the melting temperature of sulfur, and liquid sulfur and lye are separated and withdrawn from the separation tank, the improvement wherein the separation tank is operated in the flooded condition, the liquid sulfur is fed into a vertical separation pipe in which a separation layer between the liquid sulfur and lye is established, and the liquid sulfur is drained out of the separation pipe.

3. Apparatus suitable for separating sulfur from a sulfur-lye suspension comprising a separation tank provided with a feed pipe for the sulfur-lye suspension, and a drain pipe for lye; discharge means for liquid sulfur positioned within said separation tank; a vertical separation pipe (4) in communication with

the discharge means for the liquid sulfur, and in further communication with an outlet pipe (9) for liquid sulfur, and level



control means for continuously maintaining a separation layer within the vertical separation pipe between the liquid sulfur and lye.

4,939,818

ADJUSTABLE BUNDLING DEVICE

Blake S. Hahn, 26331 Governor Ave., Harbor City, Calif. 90710

Filed Sep. 2, 1988, Ser. No. 241,010
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 R **4 Claims**

1. A device for bundling objects, comprising

a flexible strap member having a first end portion, a second end portion, and a center portion, the flexible strap member having a top side and a bottom side;

hook and loop type fastener sections on portions of the flexible strap member comprising

a first loop fastener section on the top side of the first end portion,

a second loop fastener section on the bottom side of the second end portion, and

a first hook fastener section on the top side of the center portion,

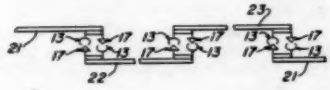
wherein the hook and loop type fastener sections further comprise a third loop fastener section on the top of the second end portion and a second hook fastener section on the bottom of the center portion.

4,939,819

WRAPAROUND CLOSURE DEVICE

James D. Moyer, Downington, Pa., assignor to The Bentley-Harris Manufacturing Company, Lionville, Pa.

Filed Jun. 28, 1989, Ser. No. 372,893
Int. Cl.[5] B65D *63/00*
U.S. Cl. 24—16 R **3 Claims**



1. A closure device for a wraparound sleeve said sleeve being formed of interleaved monofilament material formed into an open web of flexible stretchable material, said closure device comprising a pair of interlocking closure strips extending lengthwise of the web, said strips being in spaced apart, parallel relationship, each said closure strip having a projecting enlarged male bead element running lengthwise thereof and a groove female receptacle portion extending lengthwise thereof, a stitching web between said bead element and the receptacle element for stitching the closure device to the web of flexible material along the side edges thereof, said web maintaining said receptacle element in spaced apart relationship with said projecting bead element, the bead element on each of said closure elements being adapted to interfit with the groove in said receptacle portion on the other closure element, the groove having side flanges adapted to retain the bead element.

4,939,820

ROPE FASTENER

Martin P. Babcock, 2622 Guthrie Ave., N., Oakdale, Minn. 55119

Filed Jan. 3, 1989, Ser. No. 292,906
Int. Cl.[5] F16G *11/00*
U.S. Cl. 24—129 R **6 Claims**

1. A cordage coupler comprising:

(a) a rigid planar body having an outer periphery which relative to a longitudinal center axis provides for a first end whereat the peripheral edges taper inward to said longitudinal center axis as the edges extend forward, a mid-section wherein the peripheral edges are generally parallel and a relatively blunt, arcuate second end;

(b) a first through aperture in said first end adjacent said longitudinal axis;

(c) a plurality of V-shaped notches lengthwise staggered relative to one another along opposite sides of said mid-section, wherein opposite facing surfaces of each notch include a relatively thin co-extensive beveled region;

(d) a closed loop arm transversely projecting from a front surface of said body at said second end and having a bore parallel to said longitudinal axis; and

(e) wherein a first cordage member end is securable to said first aperture and a second cordage member end length adjustably mounts through said bore and said first aperture before being wrapped about a rear surface of said body and itself at each of said notches and passed back through said bore.

4,939,821

DROP WIRE CLAMP ASSEMBLY

George J. Frank, Jr., 664 Thompson Cir., Inverness, Ill.

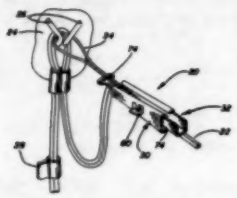
Filed Feb. 9, 1989, Ser. No. 308,184
Int. Cl.[5] F16G *11/04*
U.S. Cl. 24—136 R **10 Claims**

1. A drop wire clamp assembly for supporting an insulated wire, comprising:

a housing having a U-shaped cross section formed by a pair of side walls and a center wall, the side walls and center wall extending longitudinally to define an open channel for locating the insulated wire therein in abutment with the center wall, and an aperture formed in at least one of the walls,

a separate elongated pad extendable along the length of the open channel and spaceable from the center wall to sandwich the insulated wire between the pad and the housing

and having a tab extending outwardly from the pad and insertable into the aperture in the housing to thereby form a retaining means for releasably capturing the pad relative to the housing to prevent the pad from dropping out of the open channel while allowing motion transverse to the axis of the open channel and tiltable within the channel, said retaining means allowing the pad to be attached to and



released from the housing, the tab on the elongated pad further includes a snap fit connector which expands to thereby retain the tab within the aperture of the housing, and

a slide assembly having an elongated shape interconnectable with the housing for movement within the open channel to press the elongated pad against the insulated wire to firmly hold the insulated wire within the assembly.

4,939,822

FASTENING ELEMENT

Klaus Henn, Engstetten 48, A-3352 St. Peter der Au, Austria

PCT No. PCT/AT88/00019, § 371 Date Dec. 5, 1988, § 102(e) Date Dec. 5, 1988, PCT Pub. No. WO88/08098, PCT Pub. Date Oct. 20, 1988

PCT Filed Apr. 8, 1988, Ser. No. 295,310

Claims priority, application Austria, Apr. 10, 1987, A909/87

Int. Cl.[5] F16L *33/02*

U.S. Cl. 24—271 **7 Claims**

1. A fastening device manufactured of a strip of sheet material and comprising

(a) a flexible tongue capable of being looped around an element to be fastened, the tongue having

(1) a hook-shaped free end,

(2) an end opposite to the hook-shaped free end, and

(3) a widened portion adjacent the opposite end, and

(b) a holding part projecting at an angle from the opposite tongue end and being bendable towards the tongue along a folding line adjacent the opposite tongue end, the holding part being integral with the tongue and

(1) having a hook-up edge spaced from the opposite tongue end and arranged to be engaged by the hook-shaped free end when the flexible tongue is looped around the element to be fastened,

(2) defining an elongated aperture having a width slightly exceeding the width of the tongue and extending from the folding line towards the hook-up edge into the widened tongue portion, the hook-up edge being constituted by a web bridging the elongated aperture, and

(3) being operable as a lever upon bending the holding part towards the tongue along the folding line for tightening and closing the fastening device when the tongue is looped around the element to be fastened and the hook-up edge of the holding part has been engaged by the hook-shaped free end of the tongue.

4,939,823

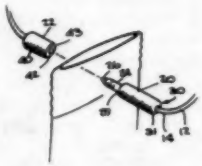
SOCK PAIRER AND HOLDER

Milton L. Klein, 30 E. 208th St., Bronx, N.Y. 10467

Filed Oct. 18, 1989, Ser. No. 423,017

Int. Cl.[5] A41F *1/00*

U.S. Cl. 24—590 **1 Claim**



1. A sock pairer and holder, comprising

(a) loop means, said loop means having two ends,

(b) clasp means, said clasp means comprising cooperating male and female threaded sections,

(c) loop securing means, said loop securing means connecting the ends of said loop to said male and female threaded sections,

(d) said loop securing embodying swivel means whereby said male and female threaded sections are axially rotatable relative to said loop,

(e) said loop securing means comprising ring means, said ring means securing the ends of said loop, said ring means being rotatably engaged with said male and female threaded section,

(f) said swivel means comprising head means joined to said ring means, said head means rotatably engaging sockets in said male and female threaded sections,

(g) said male threaded section comprising a male shoulder portion and a screw portion joined thereto, and said female threaded section comprising a female shoulder portion, the axial length of said male threaded section exclusive of said threaded screw portion being approximately three-quarters of an inch and the axial length of said clasp means when said male threaded section and said female threaded section are joined being approximately one and one-quarter inches, said threaded screw portion being pointed thereby being adapted to pierce the socks.

4,939,824

VEHICLE SAFETY BELT BUCKLE COVER

Delores A. Reed, 9739 Harmony Dr., Indianapolis, Ind. 46231

Filed Aug. 11, 1989, Ser. No. 392,599

Int. Cl.[5] A41F *1/00*; A44B *11/25*

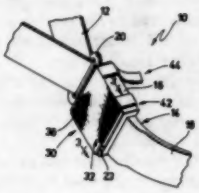
U.S. Cl. 24—633 **2 Claims**

1. A cover for covering a buckle of a vehicle safety belt, said buckle having a safety belt releasing button on a surface thereof which is adapted to be depressed to open said safety belt, said cover comprising:

a generally rectangular-shaped covering member for substantially covering said surface of said buckle and said releasing button thereon, said covering member comprising an outer, flexible fabric layer and an inner, less flexible, relatively rigid sheet enclosed within said outer layer, said rigid sheet being sufficiently rigid to prevent or render

more difficult the depressing of said button when said covering member covers said surface and said releasing button thereon; and

securing means for releasably securing said cover to said



safety belt, said securing means including first and second pairs of spaced strap means attached to and extending from said covering member adjacent opposite edges thereof and adapted to be extended around said safety belt for securing said cover to said safety belt.

4,939,825

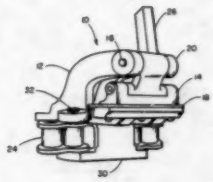
LIGHTWEIGHT TENTER FRAME CLIP

Tae H. Kwack, Fairport, N.Y., assignor to Mobil Oil Corporation, New York, N.Y.

Filed May 10, 1989, Ser. No. 349,677

Int. Cl.[5] D06C *3/04*

U.S. Cl. 26—93 **6 Claims**



1. In a tenter frame for the transverse stretching of an advancing web of a thermoplastic film material, fabric or foil, said tenter frame including a clip chain assembly having clips for engaging said webs, and chain links connected to said clips for moving the assembly along supporting rails; the improvement comprising in that at least some components of each of said clips are constituted from a lightweight polymeric material so as to reduce the weight of said clips.

4,939,826

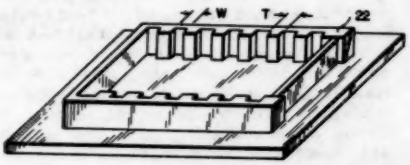
ULTRASONIC TRANSDUCER ARRAYS AND METHODS FOR THE FABRICATION THEREOF

Thomas A. Shoup, Lowell, Mass., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Mar. 4, 1988, Ser. No. 164,273

Int. Cl.[5] H01L *41/12*

U.S. Cl. 29—25.35 **10 Claims**



1. A method of fabricating an ultrasonic transducer array adapter for scanning a selected object having a predetermined object wavelength comprising the steps of:

cutting a block of piezoelectric material having a top surface in a directions perpendicular to said top surface to form a plurality of wafers, each of said wafers being of a predetermined thickness;

affixing an etchable material of predetermined depth to one side of each wafer surface except for the wafer which is to be the end wafer on the one side of the array;

forming the wafers into a spaced parallel array with each adjacent pair of wafers in the array being spaced by a layer of affixed material, the predetermined thickness for etchable material being such that the center-to-center spacing between adjacent wafers in the array is substantially equal to one-half the object wavelength; and

etching away the affixed material to leave a spaced transducer array with a substantially one-half object wavelength center-to-center spacing.

4,939,827

METHOD OF MANUFACTURING A BEARING DEVICE INCLUDING A HOUSING WITH A FLANGE AT ONE END THEREOF AND A BEARING BUSH PRESS-FITTED THEREINTO

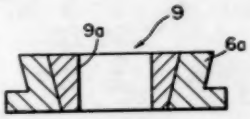
Akihiro Iizuka, Nagoya, Japan, assignor to Diado Metal Company Ltd., Nagoya, Japan

Filed Sep. 26, 1988, Ser. No. 251,352

Claims priority, application Japan, Oct. 20, 1987, 62-262706

Int. Cl.[5] B21D *53/10*; B23P *19/04*

U.S. Cl. 29—898.054 **3 Claims**



1. A method of manufacturing a bearing device, comprising the steps of:

forming a bearing bush having an inner bearing bore thereof tapered;

providing a housing having a flange at one end thereof and having a bore of a uniform inner diameter; and

press-fitting said bearing bush into the bore of said housing toward the side of the flange of said housing from the side of a non-flanged portion of the housing wherein the taper of said tapered bearing bore is selected such that, after said press-fitting step, said tapered bearing bore has an essentially uniform diameter.

4,939,828

METHOD OF PRODUCING STIFFENING PROFILES, PARTICULARLY OF REDUCED WEIGHT

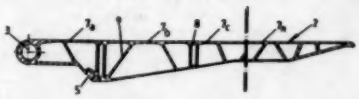
Peter Maier, Gottlieb-Daimler-Strasse, 7700 Singen, Fed. Rep. of Germany

Filed Jun. 12, 1989, Ser. No. 364,235

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1988, 3821275

Int. Cl.[5] B23P *17/00*

U.S. Cl. 29—897.2 **4 Claims**



1. A method of producing extruded profiles comprising the steps of: extruding a plurality of elongated profile sections

along an extrusion direction, joining at least one elongated edge of one of said plurality of elongated profile sections which lies substantially parallel to the extrusion direction to an elongated edge of another of said plurality of elongated sections which lies substantially parallel to the extrusion direction, and cutting through the joined elongated profile sections at a desired thickness along a plane substantially perpendicular to the extrusion direction of said extruded profile sections.

4,939,829

METHOD OF AND APPARATUS FOR MANUFACTURING A GEAR

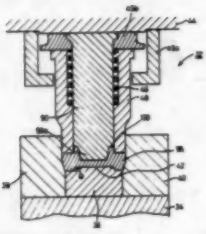
Toshio Maki; Chiyoshi Miura, and Michitoshi Koso, all of Sayama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 13, 1988, Ser. No. 218,248

Claims priority, application Japan, Jul. 13, 1987, 62-175416; Sep. 9, 1987, 62-225744; Sep. 9, 1987, 62-225745; Sep. 9, 1987, 62-137878[U]; Sep. 9, 1987, 62-137879[U]; Nov. 9, 1987, 62-281142; Nov. 9, 1987, 62-170108[U]; Nov. 25, 1987, 62-295386; Dec. 23, 1987, 62-323879

Int. Cl.[5] B21D *53/28*

U.S. Cl. 29—159.2 **20 Claims**



1. A method of manufacturing a gear, comprising the steps of:

upsetting a blank;

piercing said blank heated up to a warm forging temperature range;

forming gear teeth on said blank by warm extrusion; and

sizing said gear teeth by cold sizing.

4,939,830

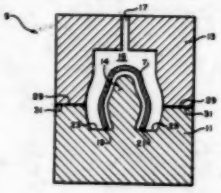
METHOD OF MAKING ELASTOMERIC EMBEDDED SPRING SEAL

Robert Janian, Encino, Calif., assignor to Tetrafluor, Inc., El Segundo, Calif.

Filed Mar. 6, 1989, Ser. No. 319,346

Int. Cl.[5] B21F *35/00*

U.S. Cl. 29—173 **7 Claims**



1. A method of forming a finished spring seal using a spring and an elastomer comprising the steps of:

(a) setting up a die, wherein said die comprises an independent male section and an independent female section;

(b) loading the spring around a protruding lip portion of said male section;

(c) positioning said female section so that a central portion thereof surrounds said protruding lip portion of said male section and at least part of the spring, and an outer peripheral portion of said female section abuts an outer peripheral portion of said male section;

(d) injecting the elastomer at a temperature which allows it to flow into said sections allowing the elastomer to flow around the spring and allowing a predetermined time for the elastomer to set; and

(e) obtaining the finished spring seal by separating said male and female sections and unloading the finished spring seal by flexing ends of the seal in said male section.

4,939,831

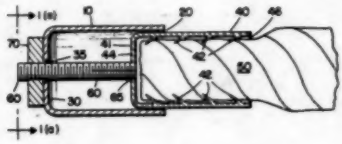
END FINISHING DEVICE FOR ROPE, WIRE, CABLE, AND THE LIKE

Michael B. Doninger, 1815 Yale Rd., Merrick, N.Y. 11566

Filed Aug. 2, 1989, Ser. No. 388,693

Int. Cl.[5] B23P *19/04*

U.S. Cl. 29—263 **20 Claims**



1. Apparatus for end finishing of a termination of an item such as a rope, cord, wire, cable, pole, rod, or the like which comprises:

(a) a hollow rigid sleeve member open at one end and having a relatively small opening at its opposite end;

(b) a threaded rod member adapted to pass freely through the relatively small opening in said sleeve member;

(c) a compressible gripping member having inwardly extending barbs for gripping said termination, said gripping member at least partially surrounding a longitudinal portion of the termination and configured to engage an end of said threaded rod at one end, and to be compressible and enable a close nesting fit within said sleeve member, said gripping member being thereby adapted to be drawn into said hollow sleeve member; and

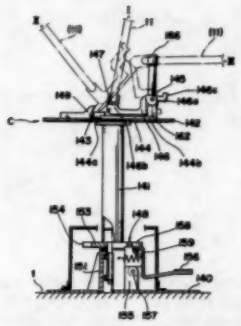
(d) a threaded fastener located outside said sleeve member and adjacent the relatively small opening thereof and peripherally engaged with said threaded rod member so that upon advancement of the threaded rod through said peripherally engaged threaded fastener, the gripping member and the termination engaged therewith are advanced a corresponding amount into the hollow sleeve member, said compressible gripping member being thereby compressed and gripping said termination, whereby said termination of said item is finished and said item is available for its desired use with said apparatus fastened thereon.

4,939,832

APPARATUS FOR ASSEMBLING A SEAT FOR USE IN AN AUTOMOBILE

Yoshihiko Satuka, and Teturo Kusuhara, both of Hiroshima, Japan, assignors to Delta Kogyo Co., Ltd., Hiroshima, Japan

Filed Apr. 20, 1989, Ser. No. 340,673
Claims priority, application Japan, Apr. 20, 1988, 63-54092[U]
Int. Cl.[5] B23Q 1/04
U.S. Cl. 29—281.4 4 Claims



1. An apparatus for assembling a seat for use in an automobile comprising:

a table rotatably mounted on a base for rotation in a horizontal plane;

a first supporting arm whose front end portion is pivotally mounted on said table about a horizontal axis of a first hinge for movement between a forward position, in which said first supporting arm forms an angle of about 45° with said table, and at least one other position;

a second supporting arm whose rear end portion is pivotally mounted on the rear end portion of said first supporting arm about a horizontal axis of a second hinge for movement between a rearward position, in which said second supporting arm forms an angle of about 90° with said table, and at least one other position;

a setting base which is mounted on the front end portion of said second supporting arm and on which the lower corner of a seat back frame is adapted to be placed in a position in which the seat back frame is approximately perpendicular to said table;

a rotation locking mechanism for locking said table at a predetermined rotational position thereof;

a first stopper for contacting said first supporting arm when the first supporting arm is in said forward position so as to lock the first supporting arm in said forward position; and

a second stopper for contacting said second supporting arm when the second supporting arm is in said backward position so as to lock the second supporting arm in said backward position.

4,939,833

DOUBLE CONTAINMENT AND LEAK DETECTION APPARATUS

Horace F. Thomas, Houston, Tex., assignor to CoreTank, Inc., Houston, Tex.

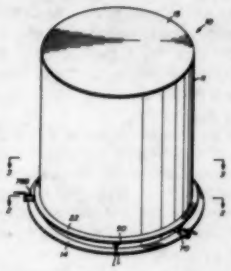
Filed Aug. 2, 1989, Ser. No. 388,593
Int. Cl.[5] B65D 90/04, 90/24
U.S. Cl. 29—401 10 Claims

1. A method for modifying a tank to allow containing and detecting leakage of stored material held in such tank, comprising the steps of:

(a) Providing a tank having a tank bottom and a shell extending above the tank bottom, and being capable of containing such stored material inside the tank above the tank bottom and within the shell;

(b) Placing a leak detection means in the tank above the tank bottom, such leak detection means being capable of detecting and sending signals in response to the presence of such stored material;

(c) Installing a leak-proof access to the leak detection means from outside the tank; and



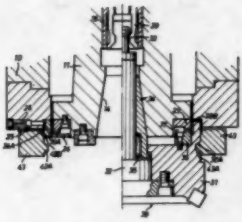
(d) Assembling a containment baffle in the tank within the shell above the leak detection means, such containment baffle including a continuous sealing surface in continuous sealing contact with the shell, for sealingly isolating a space above the tank bottom and below the containment baffle and that contains the leak detection means.

4,939,834

MACHINE TOOL WITH TOOL CHANGE MECHANISM

Hisamitsu Kawasaki, Kariya; Kunimichi Nakashima, Anjo; Kazunori Araki, Kariya, and Tsuyoshi Mizuno, Toyota, all of Japan, assignors to Toyoda Koki Kabushiki Kaisha, Kariya, Japan

Filed Oct. 28, 1988, Ser. No. 263,862
Claims priority, application Japan, Oct. 31, 1987, 62-276745
Int. Cl.[5] B23Q 3/157
U.S. Cl. 29—568 4 Claims



1. A machine tool comprising a spindle head mounted thereon and a tool spindle rotatably supported within said spindle head and being formed with a tapered bore for selectively supporting a standard tool holder or a second tool holder of large diameter inserted thereinto, a first ring gear secured to a forward end of said tool spindle in a concentric relationship with the tapered bore of said tool spindle; and a second ring gear secured to said second tool holder to be brought into meshing engagement with said first ring gear when said second tool holder has been inserted into the tapered bore of said tool spindle; said machine tool further comprising:

a protection cover member to be coupled within a forward end of said spindle head in surrounding relationship with said first ring gear when said standard tool holder has been inserted into the tapered bore of said tool spindle, said

cover member being formed to contain therein said first ring gear when it has been coupled within the forward end of said spindle head;

means for removably retaining said protection cover member in place when coupled within the forward end of said spindle head;

a protection cover part integrally formed with an outer periphery of said second tool holder in surrounding relationship with said second ring gear to be coupled within the forward end of said spindle head when said second tool holder has been inserted into the tapered bore of said tool spindle, said cover part being formed to contain therein said first and second ring gears meshed with each other when it has been coupled within the forward end of said spindle head; and

a tool change mechanism including a tool change arm provided with a pair of tool grippers each having a first grip portion for engagement with said protection cover member and a second grip portion for engagement with said second tool holder, said tool change arm being arranged in such a manner that said tool grippers are operated to couple said protection cover member within the forward end of said spindle head and remove it therefrom for replacement with said second tool holder and to insert said second tool holder into the tapered bore of said tool spindle.

4,939,835

METHOD FOR ACHIEVING THE PLANAR SURFACE OF AN ACTIVE FACE FOR A MAGNETIC RECORDING/READING HEAD

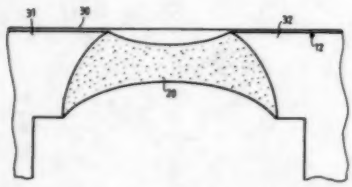
Jean-Marc Coutellier, Maurepas; Alain Jacobelli, St Michel Sur Orge; Henriette Magna, Antony, and Paul-Louis Meunier, Paris, all of France, assignors to Compagnie Europeenne de Composants Electroniques, Courbevoie, France

Filed Jun. 16, 1989, Ser. No. 366,954

Claims priority, application France, Jun. 24, 1988, 88 08527

Int. Cl.[5] G11B 5/42

U.S. Cl. 29—603 **2 Claims**



1. A method for achieving a plane surface on an active face of magnetic recording/reading heads during manufacture, wherein the active face is obtained by grinding to create magnetic pole surfaces and to expose a gap filled with non-magnetic material, the level of the material in the gap being recessed, with respect to adjacent magnetic pole surfaces, comprising the following steps:

depositing on said active face a thin layer of non-magnetic material with a thickness at least equal to the depth of the recess of the material in the gap, thereby filling said recess; and,

the deposited non-magnetic thin layer to obtain a planar surface on the active face.

4,939,836

METHOD FOR THE FABRICATION OF A MAGNETIC RECORDING/READING HEAD FROM A MAGNETIC SUBSTRATE

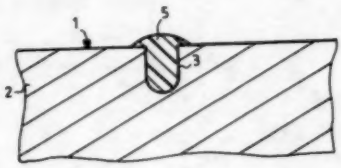
Paul-Louis Meunier, Paris; Alain Penot, Palaiseau; Jean-Marc Coutellier, Maurepas, and Claude Bussac, Ris Orangis, all of France, assignors to Compagnie Europeenne de Composants Electroniques LCC, Courbevoie, France

Filed Jun. 16, 1989, Ser. No. 366,955

Claims priority, application France, Jun. 24, 1988, 88 08526

Int. Cl.[5] G11B 5/42

U.S. Cl. 29—603 **7 Claims**



1. A method for fabricating at least one magnetic reading-/recording head having two magnetic poles from a substrate made of magnetic material, the magnetic head having an active face defined by the magnetic poles of the head separated by a gap, comprising the steps:

making a groove having a predetermined width on a face of the substrate designed to become the active face of the head;

grinding the face of the substrate that has the groove to provide a planar surface; 'hen

filling the groove with a non-magnetic material designed to form the gap to a level where the non-magnetic material juts out of the groove;

grinding the material that juts out until the planar surface of the substrate is reached and the ground surface of the material is coplanar with said planar substrate;

machining the substrate from a face other than the active face to obtain a gap of a predetermined depth;

fixing, on the magnetic poles, a part to close the magnetic field; and,

positioning a coil in the magnetic circuit formed by the poles and the closing part.

4,939,837

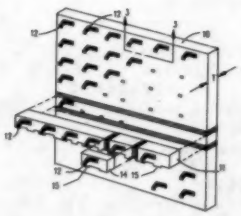
BATCH FABRICATION PROCESS FOR MAGNETIC HEADS

Mohamad T. Krounbi, San Jose, Calif., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 1, 1988, Ser. No. 239,562

Int. Cl.[5] G11B 5/42

U.S. Cl. 29—603 **4 Claims**



1. The method for batch fabrication of a plurality of magnetic heads each comprising a magnetoresistive (MR) read

transducer, said magnetic heads being formed in a plurality of rows on a substrate, each of said rows having a plurality of magnetic heads therein, said method comprising the steps of:

depositing a first layer of magnetic material over the substrate of a predetermined thickness;

depositing a layer of suitable electrically insulating material of a predetermined thickness over said first layer of magnetic material;

sputter depositing, in the presence of a magnetic field, a second layer of magnetic material of a predetermined thickness over said layer of electrically insulating material, said magnetic field being operable to orient said second layer of magnetic material in a preferred direction;

patterning said second layer of magnetic material to form a plurality of MR read transducers, each having its easy axis in a selected direction; and then

patterning said first layer of magnetic material to form a shield for each of said MR read transducers whereby said thickness and said preferred orientation of said MR transducers is maintained at the thickness and direction, respectively, established during said sputter depositing step.

4,939,838

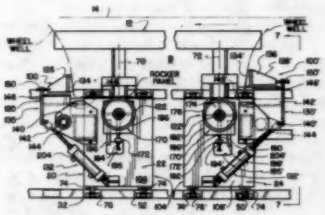
COMPLIANT POSITIONING SYSTEM FOR OPERATING ON ASSEMBLY LINE PRODUCTS

Raymond P. Gatta, 249 Ironwood Cir., Aurora, Ohio 44202

Filed Apr. 3, 1989, Ser. No. 332,473

Int. Cl.[5] B23P *19/00*

U.S. Cl. 29—795 **16 Claims**



1. A positioning system for automatically positioning first and second spaced apart portions of a fixture or tool holding platen in precise positions with respect to widely spaced locations on assembly line products wherein successive products have slightly differing pitch, yaw and roll orientations with respect to the positioning system, the positioning system comprising:

(a) a support unit;

(b) first and second positioner means supported by said unit for engagement with respective first and second product locations to position said first and second platen portions with respect to the first and second product locations, each of said positioner means comprising;

(i) a product locator structure for engaging a respective one of said first and second product locations and locating said product location with respect to said positioner means; and,

(ii) platen actuator means carried by said positioner means for moving a respective one of said platen portions to an operating position precisely positioned with respect to a respective one of said product locations;

(c) connecting means for securing said platen actuator means to respective ones of said first and second platen portions for limited relative motion to enable said positioning system to accommodate pitch, roll and yaw variations in product orientation.

4,939,839

KNIFE WITH RETRACTABLE BLADE

Alan Gorst, Cheshire, United Kingdom, assignor to The Paramo Tools Group Ltd., Sheffield, United Kingdom

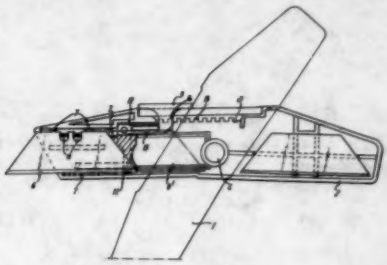
PCT No. PCT/GB88/00244, § 371 Date Nov. 1, 1989, § 102(e) Date Nov. 1, 1989, PCT Pub. No. WO88/07918, PCT Pub. Date Oct. 20, 1988

PCT Filed Mar. 31, 1988, Ser. No. 411,540

Claims priority, application United Kingdom, Apr. 4, 1987, 8708112

Int. Cl.[5] B26B *3/00*

U.S. Cl. 30—125 **7 Claims**



1. A knife comprises a handle formed in two handle portions, said handle portions being connected together by a pivot and being pivotally movable between an open position and a closed position, the handle portions in said closed position defining a housing, a retractable blade mounted on a blade carrier, the carrier being movable between a first position wherein the blade projects from the housing and a second position wherein the blade is retracted into the housing such that the blade is not substantially capable of further rearward movement characterised in that the two handle portions are locked in the closed position when the carrier is in the first position and are unlocked when the carrier is in the second position.

4,939,840

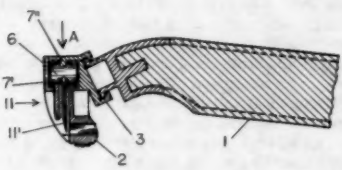
SAFETY RAZOR

Kemal Butka, 372 Central Park West, Apt. 20J, New York, N.Y. 10025

Filed Apr. 14, 1989, Ser. No. 339,231

Int. Cl.[5] B26B *21/00, 21/08, 19/38, 19/48*

U.S. Cl. 30—37 **4 Claims**



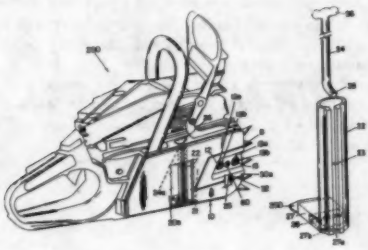
1. A safety razor, comprising a handle; a blade element movable relative to said handle in a direction which substantially corresponds to the direction of a working stroke of the safety razor during shaving; and an elastic element cooperating with said handle and said blade element and formed as a spring, said spring having one portion fixedly connected with said blade element and another portion acted upon by a force applied to said handle during a shaving stroke, said spring having two opposite ends and at least one bend located therebetween, said blade element having two blades, said one portion being formed by said ends of said spring so that one of said ends of

said spring is connected with one of said blades while the other of said ends of the spring is connected with the other of said blades, said other portion acted upon by said handle is formed as said bend.

4,939,841
CUTTING TOOL
Lieng H. Sai, 3843 Muscatel Ave., Rosemead, Calif. 90770
Continuation of Ser. No. 917,555, Oct. 10, 1986, abandoned.
This application Sep. 6, 1988, Ser. No. 241,827
Int. Cl.[5] B26B *3/00*
U.S. Cl. 30—317 11 Claims

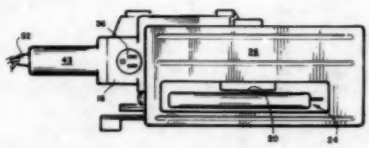
1. A cutting tool capable of manually cutting heavy growth such as tree branches with a minimum of cutting strokes, comprising an elongated handle, and an elongated rigid metal blade secured to an end of the handle, the blade having a length (L) of at least about 8 to 10 inches and a width of at least about 2 inches to provide a substantial mass of the blade distributed along the blade length, in which the handle is longer than the blade length, the blade being arranged relative to the handle for positioning a majority of the weight of the blade behind the central longitudinal axis of the handle, the blade having an inside portion tapering to form an elongated substantially straight cutting edge portion (C) extending for at least about half of the blade length, and wherein the majority of the long, straight cutting edge portion of the blade also lies behind the central longitudinal axis of the handle, the free end of the blade tapering narrower and forming a curved generally U-shaped end portion of the blade, in which the long, straight cutting edge portion of the blade merges into a curved inside cutting edge at the free end of the blade extending to the side of the central longitudinal axis of the handle opposite from the straight cutting edge portion, and in which the blade has a substantial portion of its length comprising a non-cutting outer portion behind the cutting edge with a blade thickness of at least about one-fourth inch to thereby balance the blade and provide mass for effective cutting by the straight cutting edge.

4,939,842
CASING FOR A POWER DRIVEN CHAIN SAW
Franz Rebhan, Am Birkenbach 31, 8729 Eltmann, Fed. Rep. of Germany
PCT No. PCT/DE87/00436, § 371 Date May 20, 1988, § 102(e) Date May 20, 1988, PCT Pub. No. WO88/03858, PCT Pub. Date Jun. 2, 1988
PCT Filed Sep. 23, 1987, Ser. No. 218,289
Claims priority, application Fed. Rep. of Germany, Nov. 25, 1986, 3640162
Int. Cl.[5] B27B *17/02*
U.S. Cl. 30—386 9 Claims



1. A casing for a power driven chain saw with a drive unit having a sprocket wheel driving a saw chain revolvingly on a saw rail, a rail supporting means having two fastening bolts penetrating a slot-like aperture constructed in the saw rail, a saw chain tightening device arranged within the area of the rail supporting means and a sprocket wheel cover that can be secured to the casing and covers the sprocket wheel and the rail supporting means, characterized in that the sprocket wheel cover (10) is constructed in two portions which comprise a protective cover (20) and a clamping cover (30) separable from the protective cover, the protective cover being contoured in the area of the chain tightening device to receive the clamping cover such that each of the protective cover and the clamping cover defines an outer exterior surface on the sprocket wheel cover, and the clamping cover (30) cooperating with the rail supporting means for holding the saw rail to the casing.

4,939,843
PORTABLE HANDHELD CIRCULAR SAW
Ronald S. Rogers, 10755 Felix Dr., Santee, Calif. 92071
Filed Sep. 14, 1989, Ser. No. 407,266
Int. Cl.[5] B23D *45/16*
U.S. Cl. 30—388 4 Claims



1. A portable handheld circular saw comprising:
a motor housing having a front end, a rear end, a top wall and a bottom wall;
an electric motor having a drive shaft mounted in said motor housing;
a circular saw blade mounted on said drive shaft;
a blade guard housing surrounding most of said circular saw blade;
a handgrip housing having a front end and a rear end, said front end being rigidly connected to the rear end of said motor housing, a chamber formed in said handgrip housing and a trigger switch having an electrical input terminal

and an electrical output terminal and being mounted in said chamber;

an auxiliary female electrical socket mounted in the bottom wall of said motor housing;

a first pair of electrical wires having means on one of their respective ends for connecting them to an A.C. power source, the other end of said wires being connected to the input side of said trigger switch;

a second pair of electrical wires having one of their ends connected to the output side of said trigger switch and their opposite ends connected to said electrical motor; and

a third pair of electrical wires having one of their respective ends connected to the input side of said trigger switch and their opposite ends connected to said auxiliary female electrical socket.

4,939,844

MASTER PATTERN FOR UPPER GARMENTS

Shoji Fujimura, Yamatokoriyama, and Toru Kawai, Osaka, both of Japan, assignors to Shikibo Ltd., Osaka, Japan

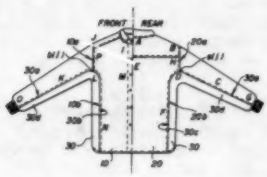
Division of Ser. No. 74,179, Jul. 16, 1987, Pat. No. 4,802,282. This application Sep. 27, 1988, Ser. No. 249,936

Claims priority, application Japan, Jul. 18, 1986, 61-170490

The portion of the term of this patent subsequent to Feb. 7, 2006, has been disclaimed.

Int. Cl.[5] A41B *1/08*

U.S. Cl. 33—12 **2 Claims**



1. An upper garment comprising:

front and rear parts each of which having a first sewing side line at one side thereof, each of said first sewing side lines having an upper end, a first substantially straight lower portion and an outwardly projected upper portion therebetween, each of said outwardly projected upper portions having a bulging portion intermediate said upper end and said first substantially straight lower portion meeting to define an apex for constituting a sleeve root; and

a lateral part being sewn with said front and rear parts at each sides thereof, said lateral part having two second sewing side lines at each side thereof and including an upper portion for constituting a sleeve bottom and a lower portion for interconnecting said front and rear parts, each of said two second side lines having a substantially straight portion of said lower portion thereof,

wherein each of said first substantially straight lower portions and a lower half of each of said bulging portions of said first sewing side lines being sewn with each of said second substantially straight portions of said two second sewing side lines, and each of said upper ends, each of said apex and an upper half of each of bulging portion being sewn with said sleeve root.

4,939,845

MULTI PURPOSE THREAD RING GAGE

Robert D. Porter, Florissant, Mo., assignor to McDonnell Douglas Corporation, Long Beach, Calif.

Filed Aug. 17, 1989, Ser. No. 394,959

Int. Cl.[5] G01B *3/48*

U.S. Cl. 33—199 R **15 Claims**

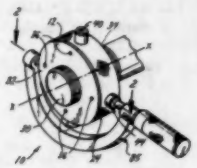
1. A multi-purpose measuring device for use in determining various parameters of an externally threaded member, and comprising:

a housing having a pair of side walls oppositely disposed from and extending substantially parallel to one another and ending in an outer surface of said housing;

said housing including a cylindrical passageway extending between said opposite side walls, said cylindrical passageway having a continuously threaded surface with a maximum diameter no greater than the maximum diameter of an externally threaded member to be measured;

said housing further including at least one pair of openings, with each opening extending from said cylindrical passageway to said outer surface;

a separate gaging plug slidably disposed within each opening, each gaging plug having an inner end facing said



cylindrical passageway and an outer end extending beyond the outer surface of said housing, and an elongated slot through each plug extending along the longitudinal axis of said plug at a distance from said inner end facing;

biasing means disposed for biasing each of said gaging plugs away from said cylindrical passageway;

stop means attached to said housing, extending through said elongated slot for retaining said biasing means; and

gaging means supported by said gaging plugs for selectively engaging an externally threaded member following its insertion into said cylindrical passageway;

whereby specific parameters of said threaded member are determinable by manipulating a micrometer or the like to engage and slide said gaging plugs against the pressure of said biasing means until said gaging means enter the cylindrical passageway and engage said threaded member.

4,939,846

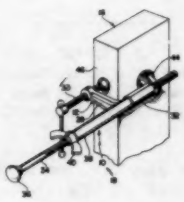
ADJUSTABLE GUIDE ASSEMBLY FOR STONE MASONS AND METHOD OF USE THEREOF

Louis Damiano, 53 Ashburton St., Providence, R.I. 02904, and Anthony G. Caputo, 7 Crow Point Rd., Lincoln, R.I. 02865

Filed Feb. 2, 1989, Ser. No. 305,271

Int. Cl.[5] B43L *13/00*

U.S. Cl. 33—404 **11 Claims**



1. An adjustable guide assembly for use in constructing a brick wall of a type including a plurality of substantially horizontal rows of bricks, the bricks in said rows having front surfaces which are substantially uniformly spaced forwardly from a substantially vertical subwall by a predetermined gauge distance, said guide assembly comprising an elongated guide member having an elongated substantially straight longitudi-

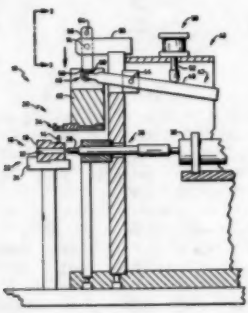
nally extending guide face theron, an elongated spacer element having a terminal end a C-clamp secured in clamping engagement on said guide member and means adjustably securing said spacer element to said C-clamp so that said terminal end is adjustably spaced outwardly from said guide face by said gauge distance, whereby when said guide member is positioned in a substantially vertical disposition with said guide face in engagement with the front surface of a bottom row of bricks in said brick wall and said terminal end in engagement with said subwall at a point which is spaced upwardly from said bottom row, said guide face defines a guide for positioning the front surfaces of the remaining rows of bricks in said brick wall.

4,939,847

TRUE POSITION GAUGE

Gerald M. Jones, Titusville, Pa., assignor to GTE Products Corporation, Stamford, Conn.

Filed Feb. 9, 1989, Ser. No. 308,067
Int. Cl.[5] G01B *21/16, 11/14*
U.S. Cl. 33—545 **4 Claims**



1. A true position gauge for checking the alignment of a plurality of electrical contacts positioned in an electrical connector, said contacts extending from the connector body and presenting a patterned array, said gauge comprising: a gauge work station; connector receiving means at said work station; connector alignment means at said work station for cooperating with said connector to present a consistent alignment to said gauge; a gauge plate at said work station, said gauge plate containing a plurality of apertures equal in number and pattern to said patterned contact array; gauge plate moving means operable to deposit said gauge plate upon said connector; and sensing means operable in conjunction with said deposit of said gauge to determine if said contacts have penetrated said apertures.

4,939,848

VEHICLE FRAME ALIGNMENT GAUGE

Orville D. Armstrong, 8221 Ave. M, Santa Fe, Tex. 77510

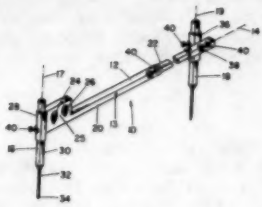
Filed Dec. 1, 1988, Ser. No. 278,563
Int. Cl.[5] G01B *5/25*
U.S. Cl. 33—608 **16 Claims**

1. An alignment gauge for checking the alignment of a vehicular frame having a plurality of reference points thereon while the alignment gauge is manually supported by an operator, comprising:

an elongate and adjustable length beam including a tubular outer beam member and a tubular inner beam member slidably movable within the outer beam member, the adjustable length beam further having a central beam axis;

a first elongate needle indicator carried on the beam and having a first tip end for positioning on the vehicle about a first reference point and selectively movable with respect to the beam along a first indicator axis perpendicular to and passing through the central beam axis;

a second elongate needle indicator carried on the beam and movable along the beam axis with respect to the first needle indicator, the second needle indicator having a second tip end for positioning on the vehicle about a second reference point and selectively movable with respect to the beam along a second indicator axis perpendicular to and passing through the central beam axis;



a T-shaped bracket including a first tubular portion carried about the tubular inner beam member and a second tubular portion perpendicular to the first tubular portion and having an interior passage for receiving the first needle indicator; and

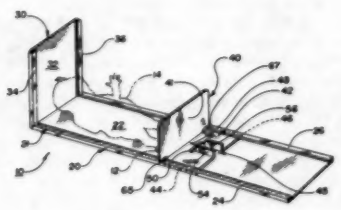
a level permanently secured to the tubular outer beam member for visually indicating when the beam is level.

4,939,849

INFANT MEASURING DEVICE

Diana L. Johnson, 10 Cty. Hwy. #4, Wrenshall, Minn. 55797

Filed Nov. 10, 1988, Ser. No. 269,423
Int. Cl.[5] G01B *5/02*
U.S. Cl. 33—811 **13 Claims**



1. A device for measuring infants comprising:

an elongated measuring base having at least one sequence of linear measuring indicia thereon extending from one end of the measuring base parallel to the axis of elongation and further having a pair of opposed channels extending substantially the length of the measuring base parallel to the axis of elongation;

a fixed end stop extending upward from said one end; and

a measuring stop slidably connected between the pair of opposed channels of the measuring base, said measuring stop comprising:

a channel slide member that is a flat member having two opposed, generally parallel, channel-engaging edges with a spring opening lying therebetween, the normal distance between said channel-engaging edges being slightly greater than the distance between the interior channel surfaces that it engages such that the channel-engaging edges are biased to frictionally engage the interior of said opposed channels;

release means operably connected to said channel slide

member for counteracting the bias toward frictional engagement of the interior of said opposed channels, said release means comprising a pair of opposed flanges, one connected on each side of said spring opening, such that when the flanges are squeezed together the width of the spring opening and the distance between the channel-engaging edges is reduced; and

an index panel extending upward from said channel slide member and having an indicating relationship with said at least one sequence of measuring indicia.

4,939,850

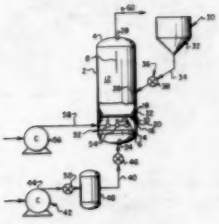
METHOD AND APPARATUS TO CONDUCT FLUIDIZATION OF COHESIVE SOLIDS BY PULSATING VAPOR FLOW

Lloyd A. Baillie, Plano, Tex., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Mar. 29, 1989, Ser. No. 330,330

Int. Cl.[5] F26B *17/00*

U.S. Cl. 34—10 **4 Claims**



1. A process for fluidizing solids in a vessel which is divided into a first chamber and a second chamber by a gas-permeable partition peripherally associated with an inside wall of said vessel, said process comprising introducing a fluidizing fluid into the first first chamber, introducing fluidizable solid particles into the second chamber, passing the fluid through the gas-permeable partition to fluidize the solids in the second chamber, and moving the gas-permeable partition from a first position to a second position and back by pulsing the fluidizing fluid into the first chamber to disrupt coherence between the particles.

4,939,851

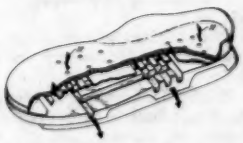
BOAT SHOE

Harry Miller, Boston, Mass., assignor to Omega Corporation, Boston, Mass.

Filed Jan. 3, 1989, Ser. No. 292,765

Int. Cl.[5] A43B *5/00, 5/08, 7/06, 13/00*

U.S. Cl. 36—3 B **4 Claims**



1. A shoe that allows water or another liquid entering the interior o the shoe to freely flow out, said shoe comprising:

an upper portion including side and top surfaces;

a sole portion attached to lower edges of side surfaces of said upper portion, said sole portion including:

an innersole including a series of perforations therethrough;

an outersole positioned below said innersole, said outer sole including a series of passageways that communicate with said perforations in order to receive water or another liquid that passes through said perforations and to lead said liquid to the exterior of said outersole; and

a lasting board positioned between said innersole and said outersole, said lasting board including openings that allow water or another liquid flowing through said perforations to enter said passageways.

4,939,852

ELASTIC FOOT SUPPORT TO BE BUILT-IN OR INSERTED IN SHOES

Edeltraud Brenner, Gartenstrasse 22a, 7918 Illertissen-Au, Fed. Rep. of Germany

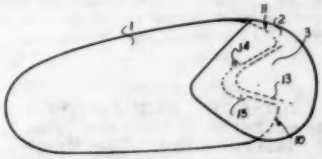
PCT No. PCT/DE87/00579, § 371 Date Aug. 29, 1988, § 102(e) Date Aug. 29, 1988, PCT Pub. No. WO88/04898, PCT Pub. Date Jul. 14, 1988

PCT Filed Dec. 8, 1987, Ser. No. 243,100

Claims priority, application Fed. Rep. of Germany, Jan. 2, 1987, 3700044

Int. Cl.[5] A43B *7/14*; A61F *5/14*

U.S. Cl. 36—44 **9 Claims**



1. An elastic foot support for insertion into shoes comprising:

a support plate with upper and lower major opposite surfaces, said support plate being in an arched form and having a frontal portion on an end thereof, said frontal portion including an aperture position approximately symmetrically with a longitudinal axis of said support plate; and

an elastically flexible support body having at least two toroidally shaped projections on a botton surface thereof, said support body being fastened to said support plate in such a manner that some paart thereof presses through said aperture when said support plate is pressed downward by a foot and thereby provides a massaging effect upon said foot, and said support body overlapping both said upper and lower major opposite surfaces of said support plate.

4,939,853

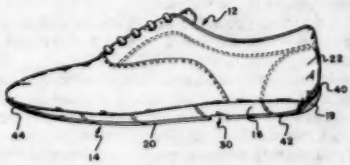
MARCHING SHOE

Jon Farbman, 251 W. 74 St., New York, N.Y. 10023

Continuation of Ser. No. 139,653, Dec. 30, 1987, abandoned. This application May 15, 1989, Ser. No. 352,620

Int. Cl.[5] A43B *3/00, 13/00*

U.S. Cl. 36—103 **12 Claims**



1. A formal dress marching shoe which comprises:

(a) a low-cut formal dress shoe upper portion formed of a

strong and substantially inextensible material which is compatible in appearance with a "dress uniform" having a close encircling foot enclosure including a counter section at the rear quarter section, a front quarter section with a plurality of eyelets for receiving laces, and a toe-box front section;

(b) a midsole having a foot bearing surface and a bottom surface, said midsole being secured to said upper substantially along the peripheral edge of said foot bearing surface and extending from the region below the counter section at the rear forwardly to the toe-box section with a peripheral line of demarcation between said upper and said midsole, said bottom surface having a tapered portion at the heel receiving portion of the shoe, the direction of which tapered portion is such as to converge beneath the shoe; and

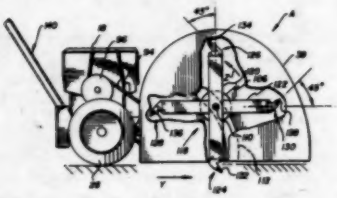
(c) an elongated outer solepiece having a substantially planar ground engaging bottom surface secured to and covering said midsole bottom surface and extending upwardly over said tapered portion in a curving arcuate course from said heel-receiving region to about a portion of the outer surface of the couter section at the rear of said upper which thereby permits a wearer of said shoe to perform "corps style" marching maneuvers, said outer solepiece including a notch therein which extends across the solepiece transverse to the length thereof suitable to receive a "hold-down strap of a dress uniform" decorative adornment.

4,939,854

ROTARY TRENCHING MACHINE

Gary R. Boren, 22501 Rd. 19, P.O. Box 147, Vona, Colo. 80861

Filed Jul. 31, 1989, Ser. No. 386,977
Int. Cl.[5] E02F 3/08
U.S. Cl. 37—94 **19 Claims**



1. A push or pull type of trenching machine, comprising:

(a) base frame means;

(b) said frame means having a first surface and a second surface;

(c) said frame means having first and second ends and sides;

(d) said first end including motor means and a first ground engaging means;

(e) means connecting said motor means to said first ground engaging means for driving said first ground engaging means;

(f) said second end including a second ground engaging means;

(g) digging means cantilevered from said first and second ends of said frame means;

(h) said second ground engaging means including an offset portion positioned inside of said first ground engaging means;

(i) said digging means having a portion positioned adjacent said offset portion of said second ground engaging means and in front of said first ground engaging means;

(j) said frame means being open on one side thereof;

(k) said digging means disposed adjacent said open side of said frame means;

(l) steering means secured to said frame means at first end thereof; and

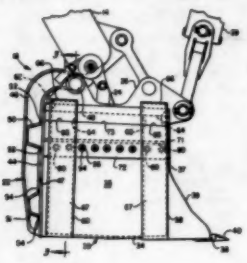
(m) said first and second surfaces each including means for mounting said motor means on one of said first and second surfaces, depending upon the push or pull position of the trenching machine.

4,939,855

EXCAVATOR DIPPER WITH LIGHTWEIGHT REPLACEABLE SECTION

Robert A. McCreary, Jr., Gillette, Wyo., assignor to Atlantic Richfield Company, Los Angeles, Calif.

Filed Aug. 14, 1989, Ser. No. 393,603
Int. Cl.[5] E02F 3/30, 3/407
U.S. Cl. 37—103 **9 Claims**



4. An excavating dipper for use with an earth excavating machine and having an enhanced payload capacity, said dipper comprising:

a topwall including bracket means for connecting said dipper to said excavating machine;

opposed upper sidewalls spaced apart from each other and connected to and depending from said topwall;

a lower section of said dipper including lower sidewall members and a bottomwall, at least said lower sidewall members being of a thickness less than said upper sidewalls and removably securable to said upper sidewalls by removable fastener means for disposing of said lower dipper section when it is worn or damaged without replacing said topwall and said upper sidewalls; and

support rib means on said upper sidewalls and said lower sidewall members, respectively, and secured to each other to strengthen said dipper.

4,939,856

ADJUSTABLE STEAM FLOW CONTROL FOR AN ELECTRIC STEAM IRON

Peter A. Czerner, Trumbull, Conn., assignor to Black & Decker Inc., Newark, Del.

Filed Sep. 25, 1989, Ser. No. 411,954
Int. Cl.[5] D06F 75/18
U.S. Cl. 38—77.7 **21 Claims**

1. A steam control system for a steam iron, comprising:

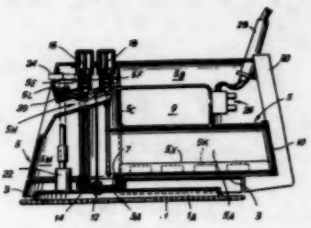
a housing including a water reservoir and a steam-forming chamber;

a valving orifice between said reservoir and said steam-forming chamber for admitting water from said reservoir into said steam-forming chamber;

a longitudinally extending metering member having a portion extending into said valving orifice and movable toward and away therefrom to control the water flow between said reservoir and said steam-forming chamber, said metering member mounted in threaded engagement with said housing whereby rotation of said metering member about its longitudinal axis causes a change in the water flow rate between said reservoir and said steam-forming chamber;

a first gear member connected to said metering member for rotation therewith,

a second gear member in engagement with said first gear



member and rotatable in one direction or the other to rotate said metering member and effect a change in the water flow rate between said reservoir and said steam-forming chamber.

4,939,857

IRON WITH A MAIN ASSEMBLY BODY AND A HEAT SEPARATOR

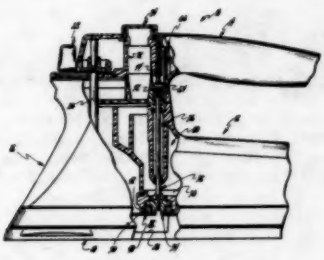
Mauro Biancalani, Via Ida Baccini No.11, 50100 Firenze, Italy

Filed Dec. 21, 1988, Ser. No. 288,283

Claims priority, application Italy, Dec. 23, 1987, 9583 A/87

Int. Cl.[5] D06F *75/20, 75/36*

U.S. Cl. 38—77.8 **7 Claims**



1. An iron assembly including a handle and an incorporated reservoir, comprising:

a single molded piece defining a reservoir cavity having a rear opening;

an obdurator fixable to said molded piece to seal said rear opening;

said single molded piece providing a handle portion defining an additional cavity with an opening at the rear;

said single molded piece defining a front funnel-shaped opening, said funnel-shaped opening communicating with said reservoir cavity at a top portion of said reservoir cavity;

said single molded piece defining a bottom opening communicating with said reservoir cavity;

a cover engageable with said single molded piece to close said bottom opening, said cover defining a fluid delivery opening;

a heating plate having a fluid chamber communicating with said fluid delivery opening;

a heat separator positioned between said reservoir cavity and said heating plate;

said molded piece defining pumping seats positioned at a top side of said single molded piece opposite said bottom opening; and

pumping means positioned in said pumping seats for pumping fluid in said reservoir cavity.

4,939,858

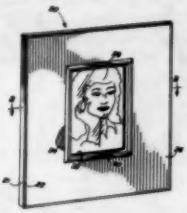
PICTURE FRAME

Michael P. Dailey, 26 Preakness Ct., Lake Oswego, Oreg. 97035

Filed Jan. 6, 1989, Ser. No. 293,992

Int. Cl.[5] A47G *1/06*

U.S. Cl. 40—152.1 **23 Claims**



1. A picture frame including in combination:

a one-piece unitary base member having an outside edge and a front surface having a first portion in a plane recessed from the outside edge, so that the edge of said base member extends a first predetermined distance perpendicularly beyond the plane of said first portion at a junction therewith;

a second recessed portion in said front surface of said base member and located within said first portion in a plane recessed from the plane of said first portion a second predetermined distance;

an inner clamping frame having a picture viewing opening therethrough, dimensioned for fitting within said second recessed portion, and having flange means overlying said first portion about the periphery of said second recessed portion.

4,939,859

AIR-LIQUID KINETIC SCULPTURE APPARATUS

Gordon E. Bradt, Rt. 2 Box 470, Eureka Springs, Ark. 72632

Filed Apr. 13, 1989, Ser. No. 336,781

Int. Cl.[5] G09F *19/00*

U.S. Cl. 40—406 **7 Claims**

1. In an air-liquid kinetic motion apparatus including an unsealed container with at least one transparent side suitable for viewing into said container, said container filled with a transparent liquid, an air supply means for discharging an array of air bubbles throughout the liquid;

wherein the improvement comprises; vessels submerged in said liquid, said vessels being substantially closed on all their sides except their bottoms which are substantially open, said vessels weighted so that they have a specific

gravity less than unity when containing a small amount of air but the weight is limited to allow the vessels to become buoyant when they accumulate a greater amount of air, and said vessels weighted so that their center of gravity remains below their center of buoyancy even when said vessels are in a buoyant state; a lower stop means to position the vessel at the bottom of its travel until it accumulates enough air to become buoyant, an upper stop means to terminate the rise of a buoyant vessel at some point below the surface of said liquid, said upper stop means combined with an escape means for discharging enough air to return the vessel to a non-buoyant state, said escape means functioning without the use of mechanical valves; whereby said vessels rise and fall within said container in a cyclical manner.

4,939,860

CYCLIC REARRANGEMENT DEVICE FOR STACKED RECTANGULAR SHEETS

Peter Ackeret, Kusnacht, Switzerland, assignor to Licinvest AG, Chur, Switzerland

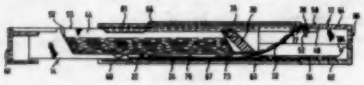
Continuation of Ser. No. 216,153, Jul. 7, 1988, Pat. No. 4,879,825, which is a continuation of Ser. No. 897,763, Jul. 11, 1986, Pat. No. 4,759,142. This application Apr. 5, 1989, Ser. No. 334,237

Claims priority, application Fed. Rep. of Germany, Nov. 12, 1985, 3441488

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] G09F *11/30*

U.S. Cl. 40—513 **88 Claims**



1. Apparatus for the cyclic rearrangement of a pile of rectangular or square sheets, in particular a pile of photographic prints, said apparatus having first and second frame parts which are movable relative to one another and parallel to the main plane of the pile, and having means which, on movement of the frame parts backward and forward, remove an individual sheet at one end of the pile and add it to the other end of the pile, which means comprises:

(a) separating means for separating the individual sheet from the pile,

(b) feeding means for feeding sheets to the separating means,

(c) retaining means for retaining the individual sheet in the first frame part and the remainder of the pile in the second frame part, and

(d) guide means for guiding the separated individual sheet for the purpose of retaining it to the other end of the remainder of the pile;

wherein the separating means comprises:

a separator in the second frame part having surface portions bounded by an end edge for retaining the remainder of the pile; and

supporting means provided on one of the frame parts which positions the individual sheet;

and wherein, to form a through-slot for the individual sheet. there are provided spacer elements which hold the separated end edge and the supporting means at a fixed distance apart which is greater than the thickness of one sheet and less than the thickness of two sheets.

4,939,861

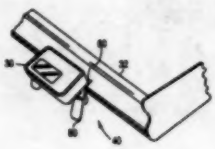
SHELF TAG MOULDING ATTACHMENT ASSEMBLY

Marc P. Soublière, Mississauga, Canada, assignor to Telepanel, Inc., Ontario, Canada

Filed Dec. 28, 1987, Ser. No. 138,585

Int. Cl.[5] G09F *3/20*

U.S. Cl. 40—651 **21 Claims**



1. An attachment assembly for cooperating with a shelf tag moulding, said moulding having two parallel oppositely disposed lips, the assembly comprising:

a mounting member including means, disposed at one end of said mounting member, for effecting biting engagement with one of said two parallel lips;

a lever arm rotatably coupled to said mounting member, having a cam at one end disposed to controllably engage the other of said parallel lips of said tag moulding;

said assembly being demountably secured to said tag moulding when said lever arm is rotated with respect to said mounting member.

4,939,862

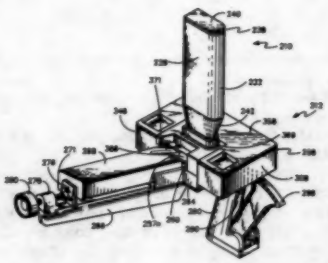
METHOD AND APPARATUS FOR ORIENTING AND LOADING CARTRIDGES

Ernest Brandenburg, Dallas, Tex., and M. Gaines Chesnut, Kremmling, Colo., assignors to Ram-Line, Inc., Golden, Colo.

Continuation-in-part of Ser. No. 902,888, Sep. 2, 1986, Pat. No. 4,739,572. This application Nov. 5, 1987, Ser. No. 117,247

Int. Cl.[5] F41A *9/66*

U.S. Cl. 42—88 **14 Claims**



1. An apparatus for loading a plurality of cartridges into a magazine having an open end, comprising:

holding means for positioning the magazine;

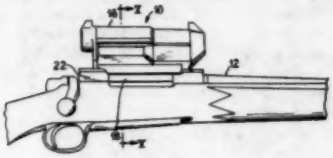
cartridge moving means operably connected to said holding means for moving a first cartridge having a nose portion, said cartridge moving means defining a cartridge holding region and comprising a hook-shaped portion for engaging said nose portion of said first cartridge to limit movement of said first cartridge away from said cartridge holding region.

4,939,863

LASER AIMING DEVICE FOR FIREARMS, ARCHERY BOWS, AND CROSSBOWS

James R. Alexander, Scott; Acie G. Johnson, Pine Bluff, and Glenn W. Prentice, Little Rock, all of Ark., assignors to Emerging Technologies, Inc., Little Rock, Ark.

Filed Aug. 31, 1988, Ser. No. 239,133
Int. Cl.[5] F41G 1/34
U.S. Cl. 42—103 **13 Claims**



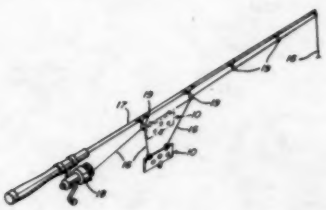
1. A laser aiming device for firearms comprising:
a housing member having a cavity adapted to receive a laser plasma tube;
a laser plasma tube positioned within said cavity;
a cylindrical member positioned within said cavity so as to surround said plasma tube about a longitudinal axis; and
resilient means separating said cylindrical member and said plasma tube to cushion the plasma tube from shock forces generated by the firearm with which it is utilized;
wherein said cylindrical member includes interconnecting cylindrical sleeve portions, one of which can be partially inserted into one end of the other.

4,939,864

VISUAL FISHING AID

Thomas J. Bowles, P.O. Box 6034, Dayton, Ohio 45405

Filed Nov. 3, 1989, Ser. No. 431,749
Int. Cl.[5] A01K 89/01
U.S. Cl. 43—17 **14 Claims**



1. A fish strike indicator comprising a substantially rectangularly shaped plate, a plurality of openings located on one longitudinal (long) portion of said plate, a plurality of spring ring means for attaching to a fishing line, said ring means positioned within said openings in said plate, a plurality of anti-sail openings located elsewhere in said plate and ballast means located on the lower portion of said plate.

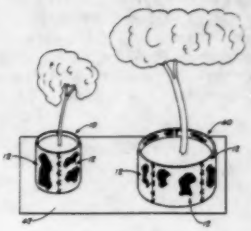
4,939,865

METHOD AND CONTAINER FOR GROWING TRANSPLANTABLE PLANTS

Carl E. Whitcomb, Rte. 5, Box 174, Stillwater, Okla. 74074, and Harold D. Stephens, P.O. Box 506, Jenks, Okla. 74037

Filed Apr. 14, 1988, Ser. No. 181,720
Int. Cl.[5] A01G 9/10
U.S. Cl. 47—77 **16 Claims**

1. A plant container, comprising a plurality of identical upwardly extending removably joined substantially planar side panels which are bendable and which have vertical edge joints adapted so that said side panels are bent arcuately in response to being removably joined to form a generally cylindrical open-topped container of selected size for receiving a growing medium and a transplantable plant, wherein each of said side panels includes a plurality of holes and a lattice of root trapping outwardly pointed recesses formed in the interior surface



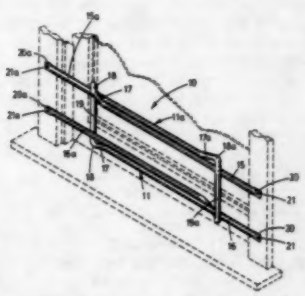
thereof with each of said recesses terminating in one of said holes whereby said roots are directed by said recesses to said holes, and wherein all of said vertical edge joints permit said side panels to be disconnected and removed laterally outwardly from said growing medium.

4,939,866

WINDOW GUARD ASSEMBLY

Richard G. Kluge, Pell Lake, Wis., assignor to John Sterling Corporation, Richmond, Ill.

Continuation of Ser. No. 275,321, Nov. 22, 1988, abandoned. This application Feb. 8, 1990, Ser. No. 478,718
Int. Cl.[5] E06B 3/68
U.S. Cl. 49—55 **5 Claims**



1. A window guard assembly comprising:
two, unitary, generally U-shaped, rigid members of identical form and structure; each member having a pair of like, rigid co-planar, parallel, laterally spaced, linear legs, and means for interjoining said legs at one end; the opposite ends of said legs being free for attachment to suitable supports;
said means comprising a transverse portion extending across said one end of each member in offset parallelism to the plane of the legs thereof, and a pair of connector portions joining said legs with the outer ends of said transverse portion;
the connector portions of each member being configured and arranged to freely and openly receive the laterally spaced legs of the other member therebetween so that said other member's legs are only partially engaged by said connector portions;
whereby said two members are adapted to be slidably assembled and disassembled with each member positioned in inverted, superposed relation with respect to the other

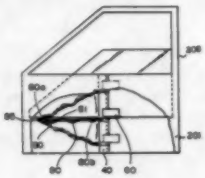
member and the transverse and the connector portions of each member cooperating to partially embrace and guide the legs of the other member for sliding movement.

4,939,867

POWER SUPPLYING SYSTEM FOR SELF-DRIVING CLOSURE DEVICE

Hiroyuki Harada, Hamamatsu; Kazuyoshi Kurahashi, Okazaki; Kengo Yamamura, Shizuoka; Youji Higuchi, Okazaki; Yasuhiro Fukatsu, Hamamatsu, and Katsuhiko Torii, Shizuoka, all of Japan, assignors to Amso Co., Ltd., Shizuoka and Nippondenso Co., Ltd., Aichi, both of, Japan

Filed Jul. 31, 1989, Ser. No. 387,276
Int. Cl.[5] E05F *15/16*
U.S. Cl. 49—349 **20 Claims**



1. A power supplying system for a self-driving closure device in which a driving source of driving a closure member for opening and closing an opening moves together with said closure member so as to open and close said opening, said power supplying system comprising:

a lead wire having one end connected to a power source and the other end connected to said driving source;

first supporting means for supporting the side of said lead wire connected to said power source substantially at a midpoint between the positions of upper and lower limits of movement of said driving source; and

second supporting means for supporting the side of said lead wire connected to said driving source in such a manner as to allow said side of said lead wire connected to said driving source to move together with said driving source;

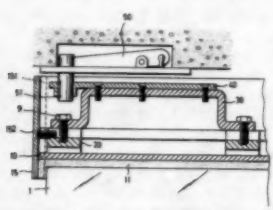
whereby said lead wire is made swingable with a portion thereof supported by said first supporting means as a center as said driving source moves.

4,939,868

DOOR HAVING A FRAME IN WHICH A SLIDING PIECE IS MOUNTED

Ching-Nan Lu, 16, Lane 83, Tsu-Chiang 1st Rd., Chien-Jin Dist., Kaohsiung, Taiwan

Filed Apr. 25, 1989, Ser. No. 343,076
Int. Cl.[5] E05D *7/08*
U.S. Cl. 49—388 **5 Claims**



1. A system for mounting top and bottom ends of a door between a pair of engaging members respectively mounted at the top and bottom and adjacent one side of an opening in a wall for pivotal movement of the door relative to the engaging members, comprising:

a pair of frame members respectively engaging the top and bottom of said door, each having an H-shaped cross-section configured to form therein a first guide channel for receiving an end of the door and a second guide channel, said second guide channel having opposing guide rails protruding inwardly from its inner sides;

an elongate slide piece disposed in each second guide channel on one side of said guide rails for slideable longitudinal movement relative to said frame member;

a connecting member having an inverted U-shape intermediate horizontally-oriented end portions disposed in each second guide channel on the side of said guide rails opposite said one side,

means including a mounting plate secured to the outer surface of each connecting member including a pivot pin projecting therefrom for defining a pivot axis of the door and adapted to be received and journalled in a respective engaging member; and

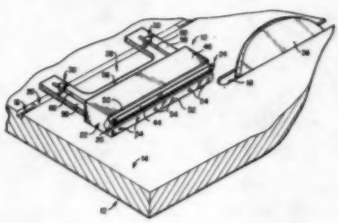
screw means interconnecting each connecting member and a respective slide piece for releasably clamping them against said guide rails for immobilizing said slide piece at an adjusted position relative to said channel at which each pivot pin correctly engages its respective engaging member.

4,939,869

METHOD AND APPARATUS FOR SHARPENING KNIVES

Noel E. Stoll, Post Office Box 5065, Avalon, Calif. 90704

Filed Oct. 20, 1988, Ser. No. 262,483
Int. Cl.[5] B24B *7/00*
U.S. Cl. 51—109 BS **15 Claims**



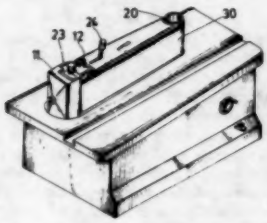
1. A combination of a table saw having a work piece table top through which an elongated slot is defined, a rotary grinding disk mounted for rotation about an axis located beneath said table top and extending upwardly through said slot where it resides in a plane intersecting said table top, and a guide channel defined in said table top and extending parallel to and displaced from said rotary disk, and a knife sharpening accessory comprising a channel following means adapted for sliding engagement in said guide channel, knife cradel means adapted to hold a knife with a knife blade such that said knife blade extends parallel to said rotary grinding disk and parallel to and in spaced separation from said channel following means at a fixed orientation relative to said work piece table top when said channel following means is engaged with said guide channel, and adjustable transverse positioning means for connecting said channel following means to said knife cradle means and for adjusting the distance of separation therebetween.

4,939,870

VERTICAL/HORIZONTAL DOUBLE-WAY GRINDING TYPE ABRASIVE BELT GRINDER

Tien-Wang Wang, No. 110-23, Hsing Pin Road, Tai Pin Hsiang Taichung Hsien, Taiwan

Filed Apr. 14, 1989, Ser. No. 337,972
Int. Cl.[5] B24B *21/00*
U.S. Cl. 51—135 R **3 Claims**



1. A vertical/horizontal double-way grinding type abrasive belt grinder, which comprises:

a base with a horizontal top plate and an assembly chamber arranged within a portion of said top plate, said assembly chamber including an opening with four positioning blocks spaced about said opening and extending from a bottom of said top plate for holding a cover plate and a self-contained horizontal grinding wheel head;

a permanently mounted vertical grinding wheel arranged at a corner of said opening and having means for angular adjustment within an angle of 45° with respect to said top plate;

said horizontal grinding wheel head having an abrasive belt wheel and a housing both arranged to cooperate with said vertical grinding wheel for mounting an abrasive belt thereabout;

vibration means for vibrating said horizontal grinding wheel head contained within said horizontal grinding wheel head and including a worm coaxially connected to said abrasive belt wheel, a worm gear engaging said worm and having an eccentric wheel thereon, and a roller wheel extending from said housing and contacting said eccentric wheel;

wherein said vertical grinding wheel provides vertical grinding when said cover plate is mounted within said opening and drives said abrasive belt for horizontal grinding with vibrating motion when said horizontal grinding wheel head plate is mounted within said opening.

4,939,871

CENTRIFUGAL PROCESSING MACHINE

Friedhold Ditscherlein, Bocholt, Fed. Rep. of Germany, assignor to Max Spaleck GmbH & Co., Bocholt, Fed. Rep. of Germany

Filed Jan. 27, 1989, Ser. No. 303,551
Claims priority, application Fed. Rep. of Germany, Jan. 28, 1988, 3802542
Int. Cl.[5] B24B *31/02*
U.S. Cl. 51—163.2 **14 Claims**

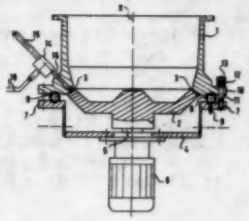
1. A centrifugal processing machine for the mechanical processing, e.g., grinding, polishing, cleaning and deburring of workpieces, with a container serving to accommodate the workpieces and processing agents, said container comprising

a substantially cylindrical casing;

a rotating bottom, in the form of a plate or similar dished structure, mounted coaxially with said casing, the peripheral edge of said bottom projecting towards the cylindrical casing and forming a narrow gap with respect to said casing;

said casing being adapted to be raised and lowered in relation to the bottom, for the purpose of adjusting automatically the width of the gap around the entire periphery of the container as a function of a controlled gap-width;

a measuring means chosen from the group consisting of mechanically, hydraulically, pneumatically, and electronically operated devices for measuring the width of the gap;



an adjusting means for automatically raising and lowering the casing and being controlled by the measuring means in such a manner that the gap-width is adjusted to a specific value and is held to this value; and

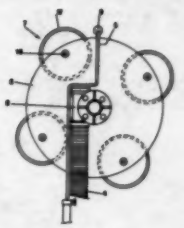
a support for said casing.

4,939,872

HONING MACHINE WITH ROTATING PLATE HAVING AT LEAST ONE HEAD WHICH DOES NOT ROTATE WITH RESPECT TO THE PLATE

Evaristo Revelin; Diego Revelin, and Fulvio Revelin, all of Aldo Noro, 7 - Isola Vicentina, Vicenza

Filed Oct. 25, 1988, Ser. No. 262,315
Claims priority, application Italy, Oct. 27, 1987, 85.625 A/87
Int. Cl.[5] B24B *23/02*
U.S. Cl. 51—180 **7 Claims**



1. A honing apparatus for removing plaster from a wall or a ceiling which comprises a dolly supporting mechanical moving means and a reservoir for water or other cooling liquid for spraying on said plaster, a flexible tube (4), a rotating command cable inserted therein, a second flexible tube (5) parallel to said flexible tube (4), said tube (5) connected to said reservoir and containing the water or liquid for spraying on the plaster, said flexible tube (4), and said flexible tube (5) exiting from said dolly at one end, a rotating plate (6) located at the other end of said flexible tube (4), said plate carrying at least one operating head (7), said operating head being fixed with respect to said rotating plate (6) and being provided with means for smoothing said plaster completely prior to the time said plaster becomes hardened, said apparatus being carried by an operator either vertically for honing a vertical wall or horizontally for honing the plaster on a ceiling, wherein said head (7) is provided with a flange (12), said flange having a central neck (11),

said neck having a central square opening, said head being mounted on the portion (10') of pin (10), said pin (10) emerging downwardly with respect to said rotating plate (6), said head being fixed thereto by means of a screw (16), spring (14) located between said neck and said screw, whereby rotation of said head with respect to said plate (6) is prevented and said head only oscillates elastically with respect to said plate whereby the honing action on said plaster is rendered more effective and more rapid with definite advantages with respect to the quality of the finished work and the rapidity of carrying out the work.

4,939,873

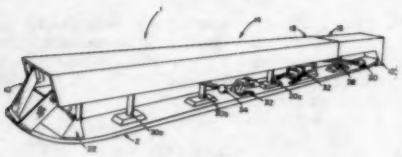
SKI GRINDING DEVICE

Edward B. Smialek, 2053 W. 13th Pl., Cleveland, Ohio 44113

Filed Jan. 24, 1989, Ser. No. 301,169

Int. Cl.[5] B24B *41/00, 41/06*

U.S. Cl. 51—281 R **14 Claims**



1. A fixture for mounting onto a flattened ski for grinding by a grinding machine, the ski having a tail section, a top section, a longitudinal axis extending the length of the ski and a running surface, said fixture device comprising:

a longitudinally adjustable frame member selectively sizeable for fixed association with the ski said adjustable frame member being adjusted to maintain the ski in a flattened position;

a tail holding means for attaching the tail section of the ski to the adjustable frame member;

a tip holding means for attaching the tip section of the ski to the adjustable frame member; and,

a plurality of biasing legs extending substantially transverse from the frame member to engage the ski and disposed to maintain the ski in the flattened position.

4,939,874

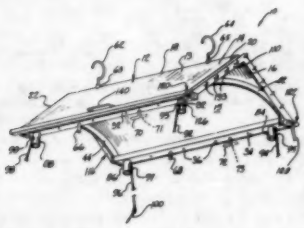
STACK CAP COVERING SYSTEM

Roy C. Compton, 1833 J and 610 Rd., Fruita, Colo. 81521

Filed Jul. 25, 1985, Ser. No. 758,884

Int. Cl.[5] E04D *1/34*; B66F *9/00*

U.S. Cl. 52—4 **7 Claims**



1. A field crop stack covering system for protecting stacked field crops such as hay from moisture and adapted for rapid mounting in an assembled state on an associated stack, comprising:

(a) an inserted V-shaped roof structure including a pair of generally planar roof panels integrally connected along a longitudinally extending roof peak line defining the top of said roof structure; said roof structure having an inverted V-shaped front edge, an inverted V-shaped back edge and a pair of parallel longitudinally extending side edges terminating in four roof corners and defining the bottom of said roof structure; said roof structure having an exterior surface and an interior surface;

(b) a first transversely extending beam attached at opposite ends thereof to laterally opposite lower portions of said first and second roof panels proximate said front edge of said roof structure and a second transversely extending beam attached at opposite ends thereof to laterally opposite lower portions of said first and second roof panels proximate said back edge of said roof structure; said first and second transversely extending beams being of substantially identical size and shape and being of an arcuate, downwardly concave configuration having a radius of curvature at least as small as an associated radius of curvature of an associated upper portion of a stack to be covered and being adapted to engage said associated upper portion of a stack, whereby said roof structure is positioned in spaced relationship from said stack, whereby air circulation about said upper portion of said stack is facilitated;

(c) stack mounting means for raising said inverted V-shaped roof structure in an assembled state onto the top of a stack;

(d) securing means for securing said roof structure to a stack;

(e) alternate support means for selectively supporting an end portion of said roof structure above a removed portion of a covered stack.

4,939,875

FOLDING STAGE SYSTEM

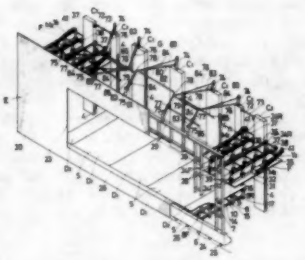
Kazuo Fujita, 1-1, Hagiyamadai, Seto-shi, Aichi-ken, Japan

Filed Feb. 27, 1989, Ser. No. 315,847

Claims priority, application Japan, Aug. 27, 1988, 63-213412

Int. Cl.[5] E04H *3/24*

U.S. Cl. 52—7 **11 Claims**



1. A folding stage system comprising

(a) a plurality of guide posts fixed to an indoor or outdoor support wall structure,

(b) central stage components provided in conjunction with central ones of said guide posts, respectively,

(c) each said central stage component having a platform and a front end portion with wheels to enable said front end portion to move smoothly toward or away from a central guide post on a floor,

(d) a flame-shaped proscenium wall having a central opening and fixed to said front end portions of said central stage components at a lower portion thereof, said proscenium wall being provided at the bottom thereof with wheels to enable said proscenium wall to move smoothly toward or away from said guide posts on the floor,

(e) side link mechanisms connecting upper portions of two sides of said proscenium wall opposed to each other with

said central opening located therebetween to outermost ones of said guide posts, respectively,

(f) a pair of opposed operating mechanisms provided for each said central stage component for folding the central stage component to a vertical position adjacent to the associated central guide post or unfolding the central stage component to a horizontal position on the floor,

(g) a pair of opposed operating mechanisms provided for each said side link mechanism for folding the side link mechanism to a vertical position adjacent to the associated outermost guide post or unfolding the side link mechanism to a horizontal position above the floor,

(h) each said operating mechanism including (i) a geared motor with an output shaft which is rotatable in either of opposed directions and (ii) an extensible swing arm member having one end fixed to said output shaft,

(i) each said geared motor for a central stage component being fixed to the central stage component at the substantial middle of the distance between front and rear ends of the central stage component,

(j) each said swing arm member for the central stage component having an opposed end connected, for pivotal movement, to a portion of the floor which is in close proximity to said support wall structure,

(k) each said geared motor for a side link mechanism being fixed to the side link mechanism at the substantial middle of the distance between front and rear ends of the side link mechanism,

(l) each said swing arm member for a side link mechanism having an opposed end connected, for pivotal movement, to said support wall structure,

(m) a central link mechanism connecting a top of said proscenium wall to tops of said guide posts, said central link mechanism being folded or unfolded simultaneously with said central stage components and said side link mechanisms, and

(n) said proscenium wall being moved toward said guide posts simultaneously with the folding of said central stage components and said side link mechanisms and moving away from said guide posts simultaneously with the unfolding thereof, said proscenium wall maintaining an upright position at all times.

4,939,876

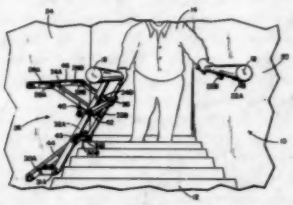
POSITION ADJUSTABLE HANDRAIL FOR USE ALONG STAIRWAYS

John M. Berner, 4927 St. Croix Ave., Golden Valley, Minn. 55422

Division of Ser. No. 220,325, Jul. 18, 1988, Pat. No. 4,856,761. This application Mar. 22, 1989, Ser. No. 327,257

Int. Cl.[5] E04F *11/00*

U.S. Cl. 52—64 **10 Claims**



1. A handrail support system for use along a passageway between first and second generally parallel walls comprising:

first and second handrails;

means for positioning the second handrail generally parallel to the second wall; and

means for positioning the first handrail in a first locked position generally parallel and substantially adjacent to the first wall and in a second locked position parallel to the first wall and spaced laterally further from said first wall than the first locked position.

4,939,877

ANCHOR DEVICE

Paul J. Claffey, 1013 Calloway, Hurst, Tex. 76053

Continuation-in-part of Ser. No. 140,590, Jan. 4, 1988, abandoned. This application Dec. 30, 1988, Ser. No. 292,523

Int. Cl.[5] E02D *5/74*

U.S. Cl. 52—155 **1 Claim**

1. A ground anchor assembly for removably supporting the post of a sign, flag, road marker or the like in the ground comprising:

a sleeve, a connector tube and a spike means, said sleeve having an elongated shape and a central bore extending therethrough lengthwise, said sleeve having a four-pointed star cross section configuration, said connector tube being of a generally quadrilateral shape with two planer faces and two faces with concave portions formed therein, and surface means on said connector tube for selective connecting to an angle, circular or square shaped post, the exterior surface of said sleeve being formed to receive said connector tube thereby removably connecting said post to said anchor assembly, said spike means comprising an elongated shaft with an enlarged head formed at one end thereof and a point formed on the end opposite said one end, said spike being mounted in said sleeve and being of sufficient length to extend through said sleeve with the head of said spike abutting the end of said sleeve whereby said pointed end of said spike can be inserted into the ground to anchor said assembly in place.

4,939,878

PROCESS FOR SEALING STRUCTURAL BODIES OR CAVITY-DEFINING WALLS WHICH MAY BE SUBJECT TO CRACKING

Alfred Schuhbauer, Hochstadt, Fed. Rep. of Germany, assignor to Alfred Kunz GmbH & Co., Munchen, Fed. Rep. of Germany

Filed Jan. 23, 1989, Ser. No. 299,370

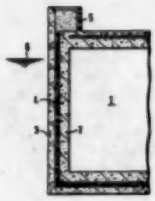
Claims priority, application Fed. Rep. of Germany, Jan. 25, 1988, 3802086

Int. Cl.[5] E04B *1/346, 1/66*

U.S. Cl. 52—169.14 **13 Claims**

10. A structural body, cavity defining wall or other structure which is sealed by an enclosing wall defining a space between the structure and the wall, with a flowable high-viscosity sealing fluid contained in said space and said space containing granular material and the fluid filling voids in the granular material for transferring pressure applied to the walls which define the space from one wall to the other by the filler so that

a pressure-transmitting, self-sealing seal is formed which will follow any deformation caused by volume changes or thermally induced movements and which will immediately close any crack formed by the walls defining the space.



4,939,879

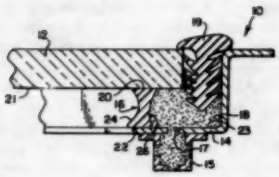
WINDOW SEALING STRIP FOR AUTOMOTIVE VEHICLES

Peter N. Gold, 465 N. Wood Rd., Rockville Centre, N.Y. 11570

Filed Feb. 15, 1989, Ser. No. 311,134

Int. Cl.[5] F06L *3/62*; B60J *1/02*

U.S. Cl. 52—208 **3 Claims**



1. A rubber sealing strip of the type used in conjunction with a curable adhesive for spacing an automotive window panel from a flanged body panel of an automotive vehicle body retaining the window panel on the flanged body panel, a flange on the flanged body panel having an outer surface on which the window panel is retained by the curable adhesive, the rubber sealing strip having a surface engaging an inner surface of the window panel, the sealing strip comprising:

a first surface forming the surface engaging an inner surface of the window panel;

a second surface, opposite said first surface, forming the surface engaging the flange, said first surface having a width greater than said second surface;

a midpoint between said first surface and said second surface;

a first side surface extending from said first surface to said second surface;

a second side surface extending from said first surface to said second surface at an angle with respect thereto, said first and second sides outwardly deformable upon engaging the flange; and

wherein said second surface of said sealing strip engaging said flange bulges outwardly on deforming; and wherein said midpoint has less thickness than the thickness of said first surface and said second surface.

4,939,880

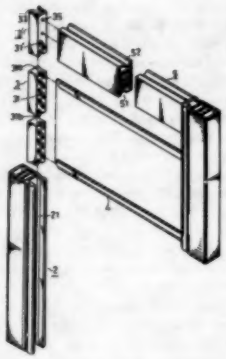
MODULAR CONSTRUCTION UNIT

Wen-Ping Wang, 39, Chung Shan Rd., Sec. 2, Kong Kuan Village, Hu-Ne Hsiang, Kaohsiung Hsien, Taiwan

Filed Sep. 14, 1988, Ser. No. 244,491

Int. Cl.[5] E06B *7/08*

U.S. Cl. 52—473 **6 Claims**



1. A modular construction unit comprising:

a plurality of supporting means each being formed as a column and each being provided with a U-shaped vertical open trough on one side, said U-shaped vertical open trough including a wider bottom side and a narrower upper portion;

a plurality of scarfing blocks, each being of sufficient width to releasably engage said U-shaped vertical open trough of said supporting means, said scarfing blocks being provided with scarfing means on one side and having said scarfing means facing outward for making combinations therewith when said scarfing blocks are inserted into said U-shaped vertical open trough of said supporting means;

a plurality of junction blocks, each being of sufficient width to releasably engage said U-shaped vertical open trough, said plurality of junction blocks being provided with at least one threaded hole and scarfing means on one side for making connections therewith;

a plurality of scarfing members, each being of sufficient width to be formed detachably secured in said scarfing means between two of said scarfing blocks and symmetrically inserted into said U-shaped vertical open troughs of said supporting means; and

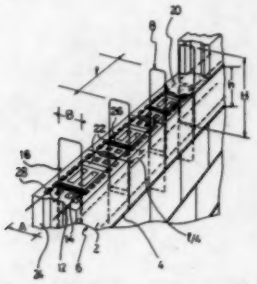
a plurality of intermediate beams, each being formed with an upper open groove and a lower open groove of sufficient width to releasably engage said scarfing members, and each end of said intermediate beams being provided with at least one screw opening for being connected to one of said junction blocks, said junction blocks being inserted into respective U-shaped vertical open troughs of said supporting means, wherein at least two of said plurality of junction blocks being positioned in opposite directions.

4,939,881

REINFORCING APPARATUS FOR A MASONRY WALL, AS WELL AS MASONRY WALL

Erwin Reisle, Zurich, Switzerland, and Guido Van de Loock, Beisele, Belgium, assignors to N.V. Bekaert S.A., Zwevegem, Belgium

Filed May 8, 1989, Ser. No. 347,635
Claims priority, application Switzerland, May 5, 1988, 1725/88
Int. Cl.[5] E04C 1/04
U.S. Cl. 52—565 20 Claims



1. Reinforcing apparatus for a masonry wall made of a plurality of building stones having vertical recesses therein, comprising:

(a) a horizontal reinforcement for placement in a bed joint;

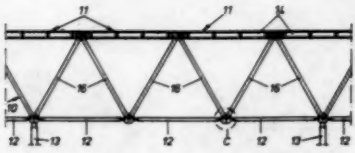
(b) a plurality of paired vertical reinforcement elements in overlapping relationship for placement into the vertical recesses, the vertical reinforcing elements having a height corresponding approximately to the height of at least two building stones.

4,939,882

PREFABRICATED PYRAMID-SHAPED STRUCTURAL MEMBERS FOR THREE-DIMENSIONAL FRAMEWORKS

Octavian Filip, Wurzburg, Fed. Rep. of Germany, assignor to Mero-Raumstruktur GmbH & Co., Fed. Rep. of Germany

Filed Aug. 10, 1988, Ser. No. 230,354
Int. Cl.[5] E04H 12/00
U.S. Cl. 52—648 4 Claims



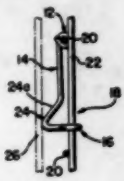
1. Prefabricated pyramid-shaped structural member for a three-dimensional framework, comprising rods which are connected with one another, wherein the rods extend diagonally toward the vertex of each structural member and are connected to a joint member, and the joint member includes a plurality of tapped boreholes for the screw connection of rods of the three-dimensional framework, characterized in that the diagonally running rods (16) are welded with their ends at the vertex of the pyramid-shaped structural member (11) to a cover plate (17), which is screwed onto the joint member (19) provided with a contact surface (20) for the cover plate (17), the cover plate (17) has a central projection (18) with a quadrangular base, and the ends of the diagonally running rods (16) are welded to the side surfaces of said projection (18) and to the cover plate (17).

4,939,883

SPACER FOR REINFORCING MESH AND SPIRAL REINFORCEMENT CAGES

Richard A. Swenson, 760 Norman Dr., Ridgewood, N.J. 07450

Continuation of Ser. No. 215,411, Jul. 5, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 438,981
Int. Cl.[5] E04C 5/18
U.S. Cl. 52—686 13 Claims



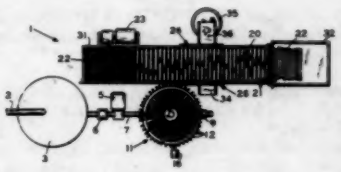
1. A spacer for positioning in spaced relation to a surface a reinforcement mesh having welded intersecting wires, comprising a unitary member of stiff but resilient spring steel wire material, said member having a central shank portion having axis of elongation B—B and a spacing projection extending outwardly from said axis of elongation in a plane containing said axis of elongation for positioning engagement with said surface, a generally corkscrew-shaped pigtail portion at one end of said shank portion and extending to one side of said shank portion along an axis of curvature A—A for engagement, along said axis of curvature, with one wire of a pair of intersecting wires of the mesh, said axis of curvature A—A of said pigtail portion lying in a plane that is generally perpendicular to the plane of said spacing projection and generally parallel to said axis of elongation B—B, and a hook portion at the other end of said shank portion for engagement with the other wire of said pair of intersecting mesh wires, said pigtail portion being adapted to be engaged with said one mesh wire along said axis of curvature A—A and said shank portion being adapted to be pivoted towards said other mesh wire against the resilience of said spring steel wire material in order to bring said hook portion into engagement with said other mesh wire.

4,939,884

HONEY STICK MACHINE

Glenn Peters, 1443 45th Ave., NE, Salem, Oreg. 97301

Filed Apr. 14, 1989, Ser. No. 338,988
Int. Cl.[5] B65B 3/04, 43/54, 63/08
U.S. Cl. 53—127 7 Claims



1. An apparatus for placing fluid in a receptacle comprising:

(a) heating means for making the fluid less viscous with pump means to make the fluid flow;

(b) a conveyer for moving receptacles past filling and closing means;

(c) a filler with a plurality of feed tubes, each tube adapted to

transfer fluid to a receptacle on said conveyor and with a hub where said hub has a stationary portion through which a feed hole extends in a direction generally towards said conveyor and has a rotating intermediate portion with a plurality of intermediate feed holes communicating with said feed hole and with said feed tubes; and

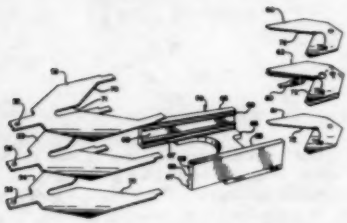
(d) means to close said receptacle.

4,939,885

CHUB MACHINE

Gary L. Steinke, Bettendorf, Iowa, assignor to The Kartridg Pak Co., Davenport, Iowa

Filed Apr. 18, 1989, Ser. No. 339,726
Int. Cl.[5] B65B *9/12, 61/06*
U.S. Cl. 53—138 A 7 Claims



1. In a machine for forming chub packages and having: means for forming a web of packaging material into a tube; means for continuously feeding said tube downwardly over a hollow mandrel; means for delivering a flowable product to said mandrel so as to discharge product from the lower end of said mandrel into said tube; and a vertically reciprocating closure head assembly through which said tube containing product passes and wherein during said passage short lengths of said tube are gathered and constricted between opposing sets of gathering plates carried on horizontally reciprocating support cams, pairs of spaced clips are applied to each said short length and each said short length is severed by a reciprocating cut-off knife between each said pair of applied clips, the improvement wherein;

one of said opposing sets of gathering plates includes a dual gathering plate comprising a pair of gathering plates fastened together in closely spaced relationship and within which said cut-off knife reciprocates, said one set of gathering plates comprises three gathering plates with said dual gathering plate being one of the three included in one of said sets and said other opposing set of gathering plates comprises three gathering plates with the center plate of the three comprising a single plate insertable between the plates of said dual gathering plate.

4,939,886

APPARATUS FOR FILLING TRAYS WITH CIGARETTES

Franco Vincenzini, Calata Pepoli-Crevalcore, Italy, assignor to Sasib S.p.A., Italy

Filed Jan. 23, 1989, Ser. No. 299,649
Claims priority, application Italy, Mar. 9, 1988, 12435A/88
Int. Cl.[5] B65B *19/10, 39/02*
U.S. Cl. 53—236 15 Claims

1. An apparatus for filling a tray with rows of rod-like articles such as cigarettes in a quincuncial arrangement comprising:

an article supplying hopper having an outlet through which the articles contained therein move by gravity;

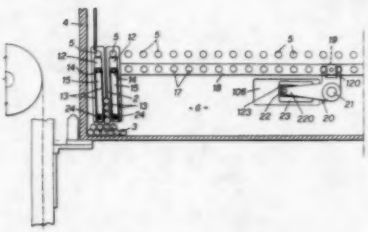
a frame;

a plurality equispaced lateral sidewalls arranged parallel to one antother and below the outlet of said hopper so as to define between respective adjacent said sidewalls respective article receiving channels through which the articles are singly stacked and moved by gravity, each said sidewall including two facing lateral plates;

a respective article roller disposed between an upper end of each respective said sidewall and said hopper, adjacent said article rollers defining therebetween an inlet for an associated said channel;

a roller moving means for imparting rotary motion to all of said article rollers;

a sidewall mounting means for mounting respective lower ends of all of said sidewalls for simultaneous and identical reciprocal motion relative to said frame and the tray;



a sidewall moving means for laterally moving all of said lower ends of said sidewalls in a reciprocating motion relative to said frame whereby the articles are deposited in the tray in a quincuncial arrangement; and

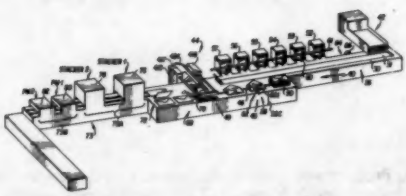
a spreading means for spreading apart associated said lateral plates of all of said sidewalls at any position of the reciprocating said sidewalls such that a distance between adjacent said sidewalls is immediately reduced from that which is larger than a diameter of the articles allowing passage of the articles along said channels to that which is smaller than the diameter of the articles to prevent passage of the articles along said channels regardless of the position of said reciprocating sidewalls.

4,939,887

INSERTION MACHINE

Dave Haas, Schaumburg; Gary VanderSyde, Naperville; Paul Beatty, and Ren Roxas, both of Chicago, all of Ill., assignors to Bell & Howell Phillipsburg Company, Allentown, Pa.

Division of Ser. No. 30,015, Mar. 25, 1987, Pat. No. 4,798,040.
This application Nov. 15, 1988, Ser. No. 271,259
Int. Cl.[5] B65B *51/02*
U.S. Cl. 53—460 9 Claims



7. A method of operating an insertion machine comprising the steps of:

transporting an envelope to an envelope flap opening means;

opening the flap of said envelope;

inserting at least one item into said flap-opened envelope;

moistening a flap of said envelope in which at least one item has been inserted, said moistening step including the steps of:

transporting said envelope toward a flap moistening means;

detecting when an envelope is in a position to be moistened, said detecting step comprising:

pivotally connecting an elongated member about an axis to a frame, said elongated member having a first end and a second end;

biasing said elongated member such that a first end of said elongated member is interposed in the path of transport of an opened envelope flap and is strikable by said flap in a manner to pivot said elongated member about its axis of connection to said frame, whereby a distance between said elongated member at a reference point on said frame changes;

creating a magnetic field in the vicinity of said reference point, said magnetic field having an electromagnetic flux density related to the distance separating said elongated member and said reference point;

determining a change in electromagnetic flux density of said magnetic field when said distance between said elongated member and said reference point changes; and,

using said change in flux density as an indication of whether an envelope having an open flap is being transported to said flap moistening means; and,

directing an atomized spray onto a gummed portion of said envelope flap.

4,939,888

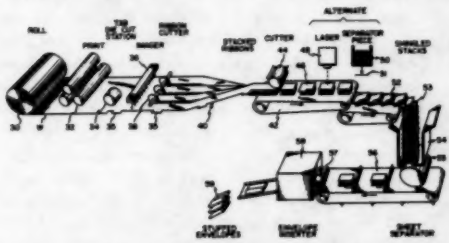
METHOD FOR PRODUCING A MASS DISTRIBUTABLE PRINTED PACKET

Robert E. Katz, Florham Park; John H. Jones, Westfield; Frederick Grainger, Greenbrook; Donald W. Schoenleber, Belle Mead; George P. Hipko, Milltown; Patrick J. Donahue, Belle Mead; Stanford Silverschotz, Livingston, all of N.J., and James Hoffman, Doylestown, Pa., assignors to Webcraft Technologies, Inc., N. Brunswick, N.J.

Filed Jun. 1, 1989, Ser. No. 360,040

Int. Cl.[5] B65B *35/50, 61/02, 61/20*

U.S. Cl. 53—411 **27 Claims**



1. A method for producing a mass distributable printed packet, comprising the steps of:

(a) printing a format of successive rectangular pieces in a plurality of longitudinal side by side lines extending parallel to the edges of the web, the pieces of each line having the same longitudinal dimension and having their transverse edges in a fixed dimensional relationship with respect to pieces in adjacent longitudinal lines, the pieces being part of a common print repeat or a submultiple thereof,

(b) separating the longitudinal lines of successive pieces along their respective side edges to form a plurality of individual longitudinal ribbons containing successive printed pieces,

(c) superposing the separated longitudinal ribbons containing the different successive pieces with respect to each other such that the forward edges of the pieces in all of the superposed ribbons are in vertical registry with respect to each other,

(d) cutting the superposed ribbons simultaneously along the forward edges of each of the pieces to obtain a common set having a single piece from each of the superposed ribbons, and

(e) placing each set of pieces as a unit within an outer container.

4,939,889

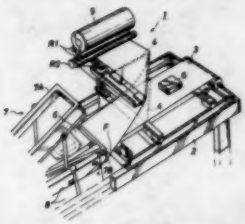
PACKAGE WRAPPING APPARATUS EQUIPPED WITH FILM HAULING DEVICE

Harumi Watanabe, Urawa, Japan, assignor to International Sankoh Kabushiki Kaisha, Omiya, Japan

Filed Jul. 19, 1988, Ser. No. 221,326

Int. Cl.[5] B65B *9/06, 51/30*

U.S. Cl. 53—450 **16 Claims**



1. A film wrapping apparatus for wrapping articles in packages of a heat-sealable thermoplastic packaging film comprising, a film-hauling device having traveling clamping runs of upper and lower endless belts for clamping a marginal selvage of a part of a folded strip of said packaging film and advancing it longitudinally, an infeed device for positioning articles successively at a position in which longitudinal superposed parts of the folded packaging film travel respectively over and under the articles for enveloping the articles successively and packaging the articles in corresponding successively formed film packages along a path of travel of the packaging film, a heat-sealing device having an upper and a lower jaw operable to an open position for allowing successive lengths of the folded packaging file to successively advanced thereinto and operable to a closed position for the jaws effecting heat sealing of the folded packaging film transversely across substantially the entire width along successive lengths of the film and simultaneously severing the corresponding sealed ends of successive film packages corresponding to successive lengths of the film advanced to define the individual film packages with corresponding articles therein, the jaws having heat-sealing means for sealing in said closed position free sides of overlapping parts of the folded film along the length of the corresponding individual lengths of film defining individual packages and for simultaneously severing the marginal selvage corresponding to the individual lengths of film defining corresponding film packages with articles therein, means for intermittently rolling up the severed marginal selvage in a roll as received intermittently from the film-hauling device, and a discharge conveyor for receiving the successive film packages with articles therein after each successive sealing of a leading end of a corresponding film package and discharging successively the complete packages when corresponding trailing ends thereof are heat sealed and severed.

4,939,890

ANTI-ROTATION METHOD AND APPARATUS FOR BOTTLE CAPPING MACHINES

Michael H. Peronek, Chagrin Falls, and Robin C. Jones, Maple Hts., both of Ohio, assignors to FCI, Inc., Cleveland, Ohio

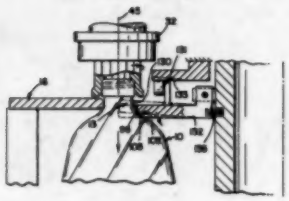
Filed Apr. 14, 1989, Ser. No. 337,870

Int. Cl.[5] B67B *3/20, 1/06;* **B65B** *7/28*

U.S. Cl. 53—486 **24 Claims**

1. A method for applying a cap to a bottle having a threaded

neck portion and a shoulder portion removed therefrom by means of a capping machine, said capping machine including a capper star wheel having a plurality of peripherally formed capper pockets and a retaining pocket underlying each capper pocket, at least one capper head for engaging a cap on a bottle positioned in a pocket at an entry position on said star wheel and tightening said cap onto said bottle with a downward force as said capping star wheel rotates said pocket to an exit position and a rear, stationary guide maintaining said bottle in said pocket when said star wheel rotates said pockets between said entry and exit positions, said method comprising the steps of



circumferentially supporting said neck portion to position said bottle in axial alignment with said capping head for a partial rotation of said capper star wheel until said capping head initially threadly engages said cap with said neck;

removing at the completion of said partial rotation at least a portion of said support from said neck so that said bottle is no longer positioned by said neck and

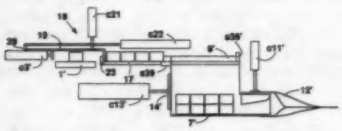
exerting an off-center, downwardly directed biasing force on said shoulder portion to wedge said bottle into engagement with said capper and retaining pockets while increasing the force at the base of the bottle with said capper star wheel whereby said bottle is prevented from rotating while said cap is tightened by said capping head.

4,939,891

AUTOMATIC BALER FOR BUNDLING TOGETHER INDIVIDUAL FOOD BAGS PREVIOUSLY FILLED IN AUTOMATIC PACKERS

Piergiorgio Podini, P.O. Box 62.149, Caracas 1060-A, Venezuela

Filed Dec. 1, 1988, Ser. No. 279,346
Int. Cl.[5] B65B *5/10, 35/50, 57/10*
U.S. Cl. 53—496 **2 Claims**



1. An automatic baler for bundling together packages previously filled, closed and sealed in a packer machine, comprising:

an endless conveyor constituting an inlet of said automatic baler, said endless conveyor operatively associated with an outlet of a packer machine in such a way that every new package therein formed is fed upon a moving surface of said conveyor;

a first station comprising a first pneumatic cylinder and a first sensor, said first station being disposed at an end of said endless conveyor in such a way that each of said packages, upon arrival at said first station is stopped and detected by said sensor and subsequently pushed by said first pneumatic cylinder in a lateral movement toward a second station;

said second station comprising a stacking hopper having a top side upon which said packages displaced from said first station by said first pneumatic cylinder are disposed side by side to constitute a layer of packages, said top side of said stacking hopper comprising a pair of endless bands of modifiable configuration, rotatably supported on respective pulley sets in such a way that said configurations are modifiable between a closed position and an open position such that when taken to said closed position said endless bands adjoin in coplanar relationship over said stacking hopper thereby closing said stacking hopper and constituting at the same time said second station for receiving said packages, and when taken to said open position, said endless bands are laterally separated in opposite directions leave open said stacking hopper allowing said packages grouped at said second station to drop downwardly into said stacking hopper, each of said endless bands being associated with a set of pulleys comprising a driven pulley, a fixed idle pulley, and a pair of moveable idle pulleys, said driven pulley and said fixed idle pulley having shafts mounted in rotatable fixed form and said pair of moveable idle pulleys having shafts mounted in rack and pinion form so as to be moveable in lateral, parallel, and opposite fashion between said closed position and said open position, said top side of said stacking hopper having a second sensor such that when said second sensor determines that a predeterminate number of said packages have been therein grouped said second senosr will activate said top side of said stacking hopper to separate said endless bands leaving open said top side of said stacking hopper in order that said layer of packages drops freely downward into said stacking hopper;

an extension of said stacking hopper defining a rear projecting mouth for receiving a mouth of bigger bag, said projecting mouth having therein associated a bag opener comprising a flat surface conforming to an upper moveable side of said rear projecting mouth capable of being moved in a vertical fashion driven by a second pneumatic cylinder between a lower position and an upper position, in such a way that when taken to said lower position said flat surface rests upon said upper side of said rear projecting mouth thereby reducing said rear projecting mouth in size so as to allow an operator to install said bigger bag, by surrounding a rear side of said rear projecting mouth with said mouth of said bigger bag, and when taken to said upper position said mouth of said bigger bag is displaced to an open condition readying said bigger bag to receive a stacking of said layers of packages integrated together by said stacking hopper;

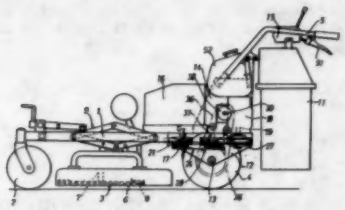
a third pneumatic cylinder disposed in association with said stacking hopper having a piston and a flat pusher on a distal end of said piston so as to be moveble in a path longitudinal to said stacking hopper when a third sensor determines that a predeterminate stack of said layers of packages has been formed in said stacking hopper, pushing in skidding fashion said stack of layers into said bigger bag while said flat surface keeps said mouth of said bigger bag open; said second pneumatic cylinder being operable to lower again said flat surface to a resting position upon said upper side of said projecting mouth freeing said mouth of said bigger bag in order that an operator can proceed to withdraw said bigger bag for later or consequently closing or sealing said bigger bag in any known manner.

4,939,892

GAIT TYPE MOWER

Masami Kawasaki, Osaka, Japan, assignor to Kubota Ltd., Osaka, Japan

Filed Aug. 4, 1989, Ser. No. 389,547
Claims priority, application Japan, Sep. 21, 1988, 63-237674
Int. Cl.[5] A01D 34/70, 35/22
U.S. Cl. 56—11.1 12 Claims



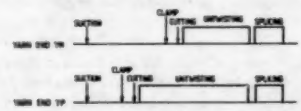
1. A gait type mower comprising:
a vehicle;
a mowing unit mounted on a front part of said vehicle;
a pair of right and left driving wheels provided at a rear part thereof;
handles positioned on the back side of said vehicle;
an engine loaded on said vehicle;
a variable speed gear interlocking with said engine and likewise loaded on said vehicle;
a pair of right and left output shafts fitted to said variable speed gear; and
belt transmission mechanisms for imparting the power from said pair of right and left output shafts to said pair of right and left driving wheels, characterized in that: said engine is placed in front of an axle of said driving wheels, while said variable speed gear is placed in rear of said axle; said output shafts are positioned substantially upwardly of said axle in front of said variable speed gear; and said belt transmission mechanisms are disposed in the up-and-down directions.

4,939,893

SPINNING APPARATUS

Michiaki Fujiwara, Kameoka, Japan, assignor to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Jul. 20, 1988, Ser. No. 221,674
Claims priority, application Japan, Jul. 21, 1987, 62-181934
Int. Cl.[5] D01H 1/115, 15/00
U.S. Cl. 57—22 15 Claims



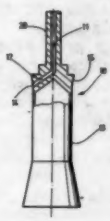
1. A spinning apparatus of the type which includes a plurality of spinning units provided in a juxtaposed relationship, and a yarn splicing bogie for traveling along said spinning units to effect a yarn splicing operation for said spinning units, characterized in that each of said spinning units comprises:
a drafting device,
an air jetting nozzle for applying a twist to a fiber bundle drafted at said drafting device,
a winding device for winding a yarn spun out from said air jetting nozzle, and
a yarn splicing device supported by said yarn splicing bogie, the yarn splicing device comprising a pneumatic yarn splicing device, wherein said pneumatic yarn splicing device has a spun out side and a package side and further comprises:
a yarn splicing member provided with a yarn splicing hole having two openings,
a pair of yarn clamp devices, each yarn clamp device disposed adjacent one of the two hole openings,
a pair of yarn cutting devices, each yarn cutting device disposed between one of the yarn clamp devices and one of the yarn splicing hole openings,
a pair of control nozzles each control nozzle disposed between one of the yarn cutting devices and one of the yarn splicing hole openings,
a pair of yarn handling levers secured to upper and lower portions of a support shaft are disposed at a location sidewardly of the yarn splicing member,
a suction pipe for sucking and holding a yarn on the spun out side and introducing the same to the yarn splicing device and
a suction mouth for sucking and holding a yarn on the package side and introducing the same to the yarn splicing device,
wherein said yarn clamp devices and yarn cutting devices are controlled to be operated by cam means such that the timing for a first clamp device and a first cutting device for the yarn on the spun out side is later than the timing for a second clamp device and a second cutting device for the yarn on the package side,
wherein said control nozzle comprises suction means for sucking and untwisting cut yarn ends according to the control of the timing for the clamp devices and cutting devices,
wherein the spinning apparatus further comprising regulating means for regulating the time for untwisting the yarn end on the spun out side to untwist the yarn end to an untwisted condition by a minimum degree for effecting a splicing operation, the regulating means also for regulating the time for untwisting the yarn end on the package side to be longer than the time for untwisting the yarn end on the spun out side,
wherein the pneumatic yarn splicing device further comprises entangling means for entangling the untwisted yarn end on the package side with the untwisted yarn end on the spun out side.

4,939,894

FUNNEL FOR A FUNNEL SPINNING APPARATUS ON A TEXTILE MACHINE

Horst Wolf, Albershausen, Fed. Rep. of Germany, assignor to Zinser Textilmaschinen GmbH, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,911
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732968
Int. Cl.[5] D01H 7/26, 7/68
U.S. Cl. 57—115 6 Claims



1. A yarn feeding funnel for feeding yarn onto a spindle of a textile spinning machine, comprising:
an upper shaft portion having an axial yarn passage extend-

ing vertically therethrough for passage of yarn therethrough; and

a body portion extending downwardly from said upper shaft portion, said body portion having a lower circumferential rim and having an outlet passage extending from said upper shaft portion passage to an opening in said body portion, said body portion having a radial extent above said opening greater than the radial extent of said opening, said body portion supporting yarn traveling in a path from said outlet passage, across said lower circumferential rim and onto a spindle of the textile spinning machine and said body portion permitting circumferential movement of yarn along said lower circumferential rim during travel of the yarn thereacross.

4,939,895

SPINNING MACHINE WITH CAN REPLACEMENT APPARATUS

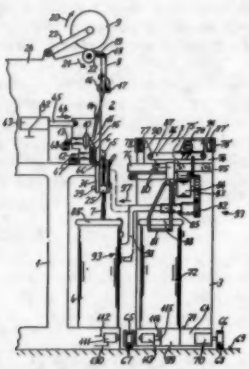
Hans Raasch, Monchen-Gladbach, and Paul Straaten, Straelen, both of Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Aug. 30, 1989, Ser. No. 400,729

Claims priority, application Fed. Rep. of Germany, Sep. 17, 1988, 3831637

Int. Cl.[5] D01H *4/50, 4/38, 9/18*

U.S. Cl. 57—263 15 Claims



1. The combination of an automatic open-end spinning machine of the type having a plurality of spinning positions each having a sliver inlet location supplied with a sliver from a sliver can, a sliver can replacement carriage for transporting sliver cans, said carriage being arranged for traveling movement alongside said spinning positions of said spinning machine, and can replacement means associated with said spinning machine and said carriage for replacing empty sliver cans at said spinning positions with full sliver cans, said can replacement means comprising means for transferring a full replacement sliver can from said carriage to a spinning position of said spinning machine, sliver guide means at each said spinning position of said spinning machine at a spacing from said sliver inlet location for guiding the sliver from the sliver can in operation to said sliver inlet location, each said sliver guide means being openable for receiving the sliver and closeable for retaining the sliver, sliver monitoring means at each said spinning position of said spinning machine in association with said sliver guide means for recognizing the presence and absence of sliver in said sliver guide means, signal transmitting means at each said spinning position of said spinning machine in association with said sliver monitoring means for producing a can-replacement signal when said sliver monitoring means recognizes the absence of sliver in said sliver guide means, signal receiving means on said carriage for receiving said can-replacement signal of said signal transmitting means, actuating means on said carriage for opening and closing said sliver guide means, means on said carriage for inserting sliver from a full replacement can into said sliver guide means, means on said carriage for joining a trailing end of sliver at a spinning position of said spinning machine with a leading end of sliver inserted from a full replacement can into said sliver guide means, and program control means on said carriage in association with said signal receiving means for actuating said can transferring means, said actuating means, said sliver inserting means, and said sliver joining means in response to said can-replacement signal.

4,939,896

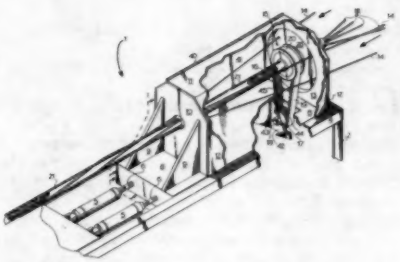
METHOD AND APPARATUS FOR S-Z STRANDING

Douglas J. Blew, Hickory, N.C., assignor to Siecor Corporation, Hickory, N.C.

Filed Jan. 26, 1990, Ser. No. 470,801

Int. Cl.[5] H01B *13/02;* G02B *6/10*

U.S. Cl. 57—293 7 Claims



1. An S-Z stranding device comprising:

(a) a first plate having an aperture therein;

(b) a second plate, having an aperture therein, spaced apart from said first plate;

(c) an elongated accumulator having first and second terminal end portions and first and second free edges, said first terminal end portion received in the aperture of said first plate and said second terminal end portion received in the aperture of said second plate;

(d) a reversing device engaged with the elongated accumulator for rotating the elongated accumulator first in one direction and then second in another direction;

(e) first stop means affixed to said elongated accumulator between said first plate and the free edge of said first terminal portion of said elongated accumulator;

(f) second stop means affixed to said elongated accumulator between said second plate and the free edge of said second terminal end portion; and,

(g) a device connected to said elongated accumulator for placing a tensile force on said elongated accumulator, said tensile force being not less than 124 pounds.

5. A method of S-Z stranding comprising:

(a) providing an elongated accumulator having a longitudinal axis;

(b) disposing a plurality of elongated strands on said elongated accumulator to be S-Z stranded; and,

(c) rotating the elongated accumulator and the elongated strands about the longitudinal axis of the elongated accumulator first in one direction and second in another direction while simultaneously applying a tensile force to said elongated accumulator of not less than 124 pounds.

4,939,897

OPENING CYLINDER UNIT FOR OPEN-END SPINNING MACHINES

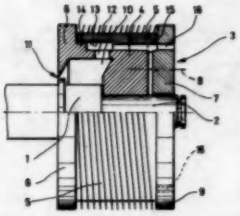
Karl-Heinz Schmolke, Neuweiler, Fed. Rep. of Germany, assignor to Hollingsworth GmbH, Fed. Rep. of Germany

Filed Jun. 30, 1989, Ser. No. 374,417

Claims priority, application Fed. Rep. of Germany, Jul. 29, 1988, 8809697

Int. Cl.[5] D01H *4/32, 11/00*

U.S. Cl. 57—301 **9 Claims**



1. An opening cylinder unit for open-end spinning machines comprising a shaft rotatably mounted in a bearing housing, on whose free end projecting from the bearing housing an opening cylinder is fixedly mounted, which engages over the bearing housing forming a hollow space, which is sealed towards the bearing housing by an annular sealing gap, characterized in that at least two cleaning ducts (15) disposed substantially in parallel to the axis of the opening cylinder unit are formed in the opening cylinder (3), which extend from the hollow space (10) at least to a front side of the opening cylinder not facing the bearing housing.

4,939,898

EXHAUST SYSTEM FOR MULTI-CYLINDER INTERNAL COMBUSTION ENGINES AND METHOD FOR CONTROLLING SAME

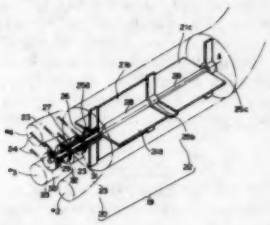
Takashi Ichimura; Koji Takamatsu; Takayuki Konuma, all of Saitama, and Takaaki Tsukui, Tokyo, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 6, 1989, Ser. No. 307,015

Claims priority, application Japan, Feb. 5, 1988, 63-024029; May 13, 1988, 63-116498; Aug. 10, 1988, 63-199383; Aug. 30, 1988, 63-216124; Aug. 31, 1988, 63-217904

Int. Cl.[5] F02B *27/02*

U.S. Cl. 60—274 **21 Claims**



1. An exhaust system for multi-cylinder internal combustion engines, the exhaust system comprising:

(a) an exhaust pipe connected at one end to each of the cylinders for receiving exhaust gas therefrom;

(b) a collector means connected with the other end of the exhaust pipes for receiving exhaust gas therefrom, said collector means including means for interconnecting the exhaust pipes in different combinations therein, and for varying the location at which the exhaust pipes are interconnected;

(c) means for sensing a plurality of operational conditions of the internal combustion engine; and

(d) a control means operated in response to said sensing means for controlling said interconnecting means for altering the combination of the exhaust pipes to be interconnected and the location of the interconnection, whereby the effective length of the respective exhaust pipes and combination thereof is altered according to operational conditions of the internal combustion engine.

4,939,899

BIDIRECTIONAL PRESSURE SUPPLY SYSTEM IN A MOTOR VEHICLE

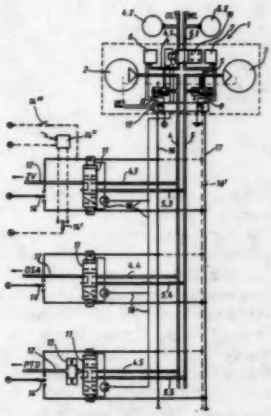
Horst Holzhauer, Schellbronn; Wolfgang Schneider, Calw; Günther Weikert, Weil der Stadt; Rudi Knelb, Sindelfingen, and Josef Schumacher, Reutlingen, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Sep. 30, 1988, Ser. No. 251,664

Claims priority, application Fed. Rep. of Germany, Oct. 1, 1987, 3733212

Int. Cl.[5] F16D *31/02*

U.S. Cl. 60—412 **20 Claims**



1. Bidirectional pressure supply system for consumers in a motor vehicle which are to be operated with fluid, comprising a pneumatic pressure generator simultaneously admitting negative pressure to a negative pressure line system and positive pressure to a positive pressure line system;

directional control valve for the alternate connection of consumers to one of the completely separate line systems via consumer individual lines;

at least one pressure-dependently responding limit stop switch for the pressure generator;

directional control valves arranged parallel to each other and adapted to be electromagnetically switched independently of each other for selectively switching the respective consumer individual lines individually and in groups between positions connected to the respective negative and positive pressure line systems and position separated from both, and

electrical triggering means for initiating operation of the pressure generator and admitting the respective supply of negative and positive pressure to the respective negative and positive pressure line systems; and

wherein each of the negative and positive pressure line systems contain a pressure-dependently responding limit stop switch for the pressure generator and a safety valve

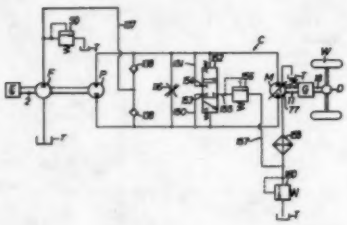
in the form of a blow-off valve in the positive pressure line system and an intake valve in the negative pressure line system, which safety valves only open after response of the associated limit stop switch in the same line system to protect the pressure generator against overloading when not consuming the respective pressure type (p_n or p_{vac}) if the pressure generator is in operation via the limit stop switch assigned to the other line system.

4,939,900

HYDRAULICALLY OPERATED CONTINUOUSLY VARIABLE TRANSMISSION

Mitsumasa Furumoto; Eiichiro Kawahara; Kenichi Ikejiri, and Noboru Yamamoto, all of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 19, 1987, Ser. No. 122,891
Claims priority, application Japan, Nov. 19, 1986, 61-275757
Int. Cl.[5] F16D 31/02
U.S. Cl. 60—456 13 Claims



1. A hydraulically operated continuously variable transmission comprising:

a hydraulic motor having a motor swash plate and a motor cylinder supporting an annular array of slidable motor plungers held in slidable contact with said motor swash plate through mutually sliding surfaces which are supplied with oil from said pump cylinder for lubrication thereof;

a hydraulic pump having a pump swash plate and a pump cylinder supporting an annular array of slidable pump plungers held in slidable contact with said pump swash plate through mutually sliding surfaces which are supplied with oil from said pump cylinder for lubrication thereof;

a closed hydraulic circuit interconnecting said hydraulic pump and said hydraulic motor, said hydraulic pump having inlet and outlet ports connected to said closed hydraulic circuit;

a lubricating chamber surrounding the sliding surfaces of the swash plate and the plungers of at least one of said hydraulic pump and said hydraulic motor;

a pair of oil passages having ends connected to said inlet and outlet ports, respectively;

a shuttle valve having two input ports connected to the other ends of said oil passages, respectively, and an output port, said shuttle valve being shiftable to connect one of said oil passages which is of lower oil pressure to said output port when the differential pressure between said oil passages is relatively large;

a first relief valve connected to said output port and openable to communicate said output port to said lubricating chamber when the oil pressure in said output port exceeds a first pressure level; and

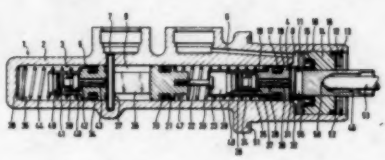
a second relief valve connected between said first relief valve and said lubricating chamber and openable when the oil pressure between said first relief valve and said lubricating chamber exceeds a second pressure level lower than said first pressure level.

4,939,901

TANDEM MASTER CYLINDER WITH PISTON STOPS AND CENTRAL VALVES

Kurt Saalbach, Moerfelden-Walldorf, and Kurt Bergelin, Niedernhausen, both of Fed. Rep. of Germany, assignors to Alfred Teves GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 21, 1988, Ser. No. 260,648
Claims priority, application Fed. Rep. of Germany, Oct. 24, 1987, 3736057
Int. Cl.[5] B60T 11/20; F15B 7/08
U.S. Cl. 60—562 2 Claims



1. In a tandem master cylinder for an automotive hydraulic brake system including a housing having a bore sealed at its opposite ends, a first and a second piston sealingly and slidably received in said bore to define a first pressure chamber between said first and second pistons and a second pressure chamber between said second piston and one end of said bore, first and second stop means in said housing respectively engageable with said first and second pistons to define respective rest positions, first and second valve means associated respectively with said first and second pistons for hydraulically connecting said first and second pressure chambers to an unpressurized supply chamber when said first and second pistons are engaged with their respective first and second stops and movable to respective closed positions sealing said first and second chambers upon movement of said first and second pistons out of engagement with said first and second stops, first spring means biasing said first piston toward said first stop, and second spring means engaged bwetween said one end of said bore and said second piston biasing said second piston toward said second stop;

the improvement wherein said first spring means comprises a shoulder on said second piston defining a spring seat facing said first piston, a hollow guide sleeve having an end wall at one end and a radially outwardly projecting flange at its other end, a clamping bolt having a head seated in said guide sleeve at said one end and a shank projecting loosely from said sleeve through said end wall and threadably received in the end of said second piston facing said first piston, and a compression spring engaged between said shoulder and said flange, ssaid first piston having a at the end thereof facing said second piston slidably received with said other end of said guide sleeve, and said first valve means comprises a valve head slidably received within a passage extending inwardly of said projection from the end of said projection facing said second piston, and a valve spring seated in said passage and biasing said valve head inwardly of said passage.

4,939,902

AIR CONDITIONER FOR AN AUTOMOBILE

William B. Retallick, 1432 Johnny's Way, West Chester, Pa. 19382

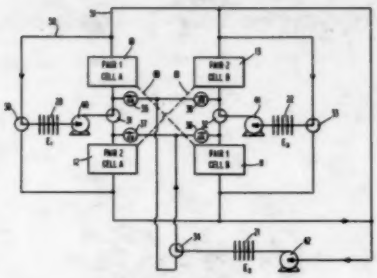
Filed Oct. 24, 1989, Ser. No. 426,009
Int. Cl.[5] F17C 11/00
U.S. Cl. 62—46.2 8 Claims

1. Apparatus for air conditioning an automobile, the automobile having an engine, the apparatus comprising:

(a) first and second pairs of hydrogen storage cells, both cells of each pair containing a material capable of forming a hydride,

(b) first, second, and third heat exchangers, the first ex-

changer continuously absorbing heat from the interior of the automobile, the second exchanger continuously rejecting heat to the ambient air outside of the automobile, the third exchanger continuously absorbing heat generated by the engine,



(c) a heat transfer fluid that circulates between the hydrogen storage cells and the heat exchangers, and

(d) means for routing the flow of heat transfer fluid as follows:

	During any interval of time	During the next interval of time
First exchanger:	First cell of the first pair	First cell of the second pair
Second exchanger:	Second cell of the first pair, and first cell of the second pair	Second cell of the second pair, and first cell of the first pair
Third exchanger:	Second cell of the second pair	Second cell of the first pair.

4,939,903

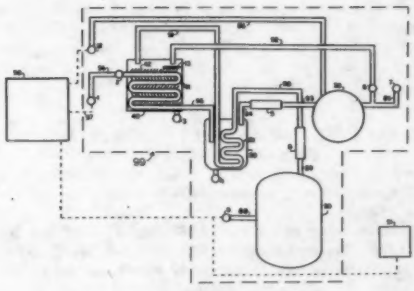
REFRIGERANT RECOVERY AND PURIFICATION SYSTEM AND METHOD

L. A. Goddard, P.O. Box 697, Hazelhurst, Ga. 31539

Filed Jul. 5, 1989, Ser. No. 375,864

Int. Cl.[5] F25B *45/00*

U.S. Cl. 62—77 **17 Claims**



10. A method for recovering and purifying refrigerant from a refrigeration unit, comprising the steps of:

providing purification means having an internal chamber and an internal coil, expansion means adjacent said internal coil, compressor means, storage means and conduit means for passage of said refrigerant;

passing said refrigerant from said refrigeration unit through said expansion means and into said internal coil thereby causing said internal coil to cool;

subsequently passing said refrigerant from said internal coil into said compressor;

subsequently passing said refrigerant from said compressor into said internal chamber, thereby externally contacting said refrigerant against said internal coils;

subsequently passing said refrigerant from said internal chamber into said storage means.

4,939,904

UNIVERSAL ACCUMULATOR

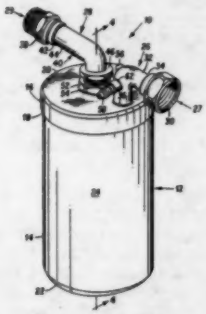
Billy M. Carlisle, Jr., 6415 Jetty, San Antonio, Tex. 78239

Division of Ser. No. 139,858, Dec. 30, 1987, Pat. No. 4,835,986.

This application May 22, 1989, Ser. No. 355,424

Int. Cl.[5] F25B *43/00*

U.S. Cl. 62—77 **3 Claims**



1. A method for replacing an automotive air conditioning system accumulator, comprising the steps of:

(a) removing said accumulator from said automotive air conditioning system;

(b) selectively rotating a first fitting of a replacement accumulator relative to a second fitting of said replacement accumulator, said first fitting having a first fitting port and said first fitting being received within a third fitting which is connected to a top of said housing of said replacement accumulator in approximately the center of said housing top, said second fitting having a second fitting port and being connected to said housing top, said first fitting being rotated so that said first fitting port of said replacement accumulator is at an angle relative to said second fitting port within the range of approximately fifteen degrees to three hundred forty five degrees, said replacement accumulator thereby being adapted to accommodate a variety of automotive applications; (c) connecting said replacement accumulator to a first line from an evaporator and a second line to a compressor.

4,939,905

RECOVERY SYSTEM FOR DIFFERING REFRIGERANTS

Kenneth W. Manz, Paulding, Ohio, assignor to Kent-Moore Corporation, Warren, Mich.

Filed Dec. 4, 1989, Ser. No. 445,763

Int. Cl.[5] F25B *45/00*

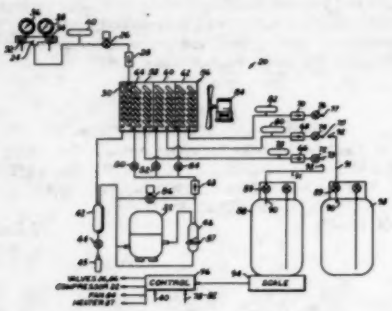
U.S. Cl. 62—77 **19 Claims**

1. In a refrigerant handling system that includes compressor means having an inlet and an outlet, means for connecting said compressor inlet to a refrigeration source, condenser means for withdrawing heat from and at least partially condensing refrigerant passing therethrough, and means for connecting said condenser means between said compressor outlet and a container for storing refrigerant, the improvement for handling differing types of refrigerants wherein:

said condenser means comprises at least first and second

condensers having independent refrigerant flow paths, and

said condenser connecting means comprise means for selectively connecting said compressor outlet alternately



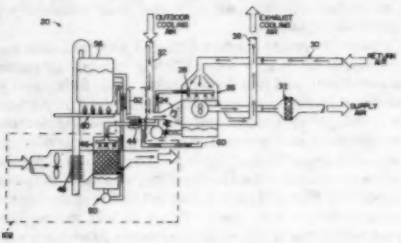
through said first and second condensers to the storage container such that differing refrigerants are fed to associated containers through corresponding condensers without substantial intermixing or contamination.

4,939,906

MULTI-STAGE BOILER/REGENERATOR FOR LIQUID DESICCANT DEHUMIDIFIERS

Mark W. Spatz, Nashua, N.H., and John J. Tandler, Arlington, Va., assignors to Gas Research Institute, Chicago, Ill.

Filed Jun. 9, 1989, Ser. No. 364,203
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—94 **11 Claims**



1. A process for regenerating liquid desiccant used in an air-conditioner comprising:

providing (a) a first and a second heat exchanger each accommodating a flow of liquid desiccant therethrough for transferring sensible energy, (b) a desiccant regenerator and, (c) a desiccant boiler;

removing diluted desiccant from the air conditioner and routing the desiccant through said first heat exchanger so that the temperature of the desiccant is raised, routing the diluted desiccant from said first heat exchanger to said desiccant regenerator wherein the diluted desiccant is partially regenerated, routing the partially regenerated desiccant through said second heat exchanger so that the temperature of the desiccant is raised, routing said partially regenerated desiccant through said desiccant boiler where said desiccant is fully regenerated with moisture from said desiccant being vaporized, routing the regenerated desiccant through said second heat exchanger to lower the temperature of said desiccant, routing said regenerated desiccant through said first heat exchanger to lower the temperature of said desiccant, returning said regenerated desiccant to the air conditioner; and

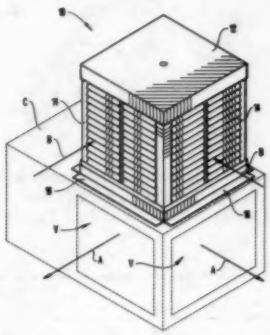
routing the vaporized moisture from said desiccant boiler to said desiccant regenerator to supply energy so that the diluted desiccant is partially regenerated.

4,939,907

EVAPORATIVE PRECOOLER AIR-CONDITIONING SYSTEM

Marc F. Taylor, 208 Scottsburg St., Bakersfield, Calif. 93312

Filed May 16, 1989, Ser. No. 352,192
Int. Cl.[5] F25D *17/06*
U.S. Cl. 62—95 **8 Claims**



1. A method of improving the operating efficiency of a refrigerant type air-conditioning system having an exteriorly mounted compressor housing including a compressor, a condenser, a side air inlet, a top air outlet and a fan for directing air through said side air inlet and out said top air outlet, comprising the steps of:

providing an evaporative cooling unit including a housing having a bottom cooled air outlet dimensioned for registry with said top air outlet of said compressor housing;

reversing the fan blades of said compressor cooling fan;

securing said evaporative cooling unit housing on a top surface of said compressor housing with said cooled air outlet in registry with said air outlet of said compressor housing;

and

connecting said evaporative cooling unit for simultaneous operation with said compressor cooling fan to provide a reversed cooled air flow through said compressor housing.

4,939,908

APPARATUS FOR ADJUSTABLY CONTROLLING THE SIZE OF AN ICE BANK

Leonard G. Ewing, 2305 Brittany Grace, New Braunfels, Tex. 78130, and Milton L. Chesnut, 1404 Deer Run, San Antonio, Tex. 78232

Continuation-in-part of Ser. No. 51,080, May 15, 1987, Pat. No. 4,823,556. This application Nov. 14, 1988, Ser. No. 272,120
The portion of the term of this patent subsequent to Apr. 25, 2006, has been disclaimed.
Int. Cl.[5] F25C *1/00*
U.S. Cl. 62—139 **18 Claims**

1. An apparatus for adjustably controlling the size of an ice bank around a cooling coil immersed in a water bath as part of a refrigeration system comprising:

a first controlling probe immersed in said water bath located at a distance from said cooling coil representing the minimum desired size of the ice bank;

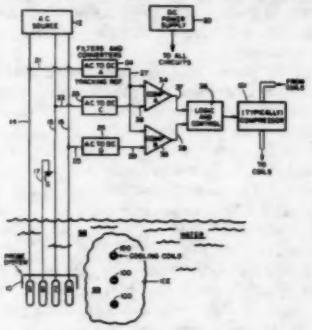
a second controlling probe immersed in said water bath and located at a distance from said cooling coil representing the maximum desired size of the ice bank;

a ground probe immersed in said water bath and located at a greater distance from said cooling coil than either of said first or second controlling probes;

a reference probe immersed in said water bath and located at a greater distance from said cooling coil than either of said first or second controlling probes;

means for producing a constant current between said first controlling probe and said ground probe, between said second controlling probe and said ground probe, and between said reference probe and said ground probe.

means for measuring the voltage potentials of said first controlling probe, said second controlling probe, and said



reference probe as constant current flows from each of said probes to said ground probe;

means for turning said refrigeration system on when the potential of said first controlling probe is equal to the potential of said reference probe;

means for maintaining the refrigeration system in an on condition even as the potential of said first controlling probe becomes greater than the potential of said reference probe due to ice formation around said first controlling probe and for turning off the refrigeration system when the potential of said second controlling probe becomes greater than the potential of said reference probe due to ice formation around said second controlling probe; and

means for adjusting the distance at which said first controlling probe is located from said cooling coil, thereby adjusting the minimum desired size of the ice bank.

4,939,909

CONTROL APPARATUS FOR AIR CONDITIONER

Yuji Tsuchiyama, and Masakazu Hosoya, both of Gumma, Japan, assignors to Sanyo Electric Co., Ltd., Osaka, Japan

Continuation of Ser. No. 35,899, Apr. 8, 1987, abandoned. This application Jul. 18, 1989, Ser. No. 383,287

Claims priority, application Japan, Apr. 9, 1986, 61-81595; Apr. 9, 1986, 61-81596; Apr. 9, 1986, 61-53206[U]

Int. Cl.[5] F25B *49/02*; H02H *7/00*

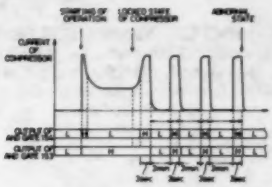
U.S. Cl. 62—158 **7 Claims**

1. A control apparatus of an air-conditioner comprising a refrigeration circuit having a compressor. a condenser, an expansion device and an evaporator connected by suitable refrigerant conduits in refrigerant flow relationship, comprising:

current detecting means coupled to a current path wherethrough a current to said compressor flows for detecting whether said current flow exceeds first and second predetermined values, said first predetermined value being a value which is exceeded only during abnormal operation of said compressor, and said second predetermined value being anon-zero value which can be exceeded during normal compressor operation,

time counting means for producing a counting output signal a predetermined time period from a time when a current in excess of said first predetermined value starts to flow through said compressor, said predetermined time period being less than the time required for a current in excess of said first predetermined value to damage said compressor, but being greater than the time required to start said compressor,

controlling means responsive to said counting output signal for controlling said current path so as to break a current



flowing through said compressor and, after a second predetermined time period, to carry a current again through said compressor,

counting means for counting and storing the number of times of repetition of breaking and re-making of a current by said controlling means,

current breaking means for breaking a current path of said compressor in response to the stored counted value of said counting means achieving a predetermined value, and

resetting means for resetting the stored counted value in said counting means when the current flow detected by said current detecting means lies between said first and second predetermined values.

4,939,910

AIR CONDITIONER

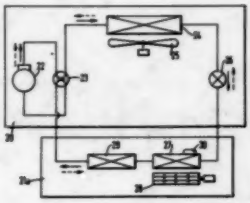
Kenji Umezu, 169-126, Kitamatsuno, Fujigawa-cho, Ihara-gun, Shizuoka-ken; Hiroshi Ito, 2348-13, Koizumi, Fujinomiya-shi, Shizuoka-ken, and Jitsuo Ikeya, 201-10, Gokanjima, Fuji-shi, Shizuoka-ken, all of Japan

Continuation of Ser. No. 114,989, Oct. 30, 1987, abandoned. This application May 22, 1989, Ser. No. 355,791

Claims priority, application Japan, Oct. 30, 1986, 61-259089; Nov. 27, 1986, 61-282922; Feb. 5, 1987, 62-23530

Int. Cl.[5] F25B *13/00, 5/00*

U.S. Cl. 62—160 **44 Claims**



2. An air conditioner provided with a heat-pump system refrigeration cycle comprising:

a compressor;

an outdoor heat exchanger;

a pressure reducing device;

an indoor heat exchanger installed within a room;

an indoor fan disposed adjacent in said indoor heat exchanger;

a radiation heat exchanger disposed in said room, said com-

pressor, said indoor heat exchanger, said radiant heat exchanger, said pressure reducing device and said indoor heat exchanger being connected in a circuit;

means for monitoring ambient temperature in said room;

means coupled to said indoor fan for allowing selection between warm-air heating during which said indoor fan is turned on and radiant heating during which an output of said indoor fan is less than the output during said warm-air heating, said allowing means including means for reducing an output of said indoor fan when the ambient temperature is close to a desired temperature during heating operation.

4,939,911

VEHICULAR KENNEL FOR PETS

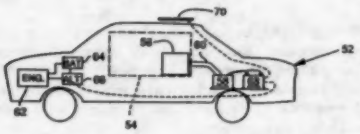
Gerald D. Mandell, 1111 Strawberry La., Ashland, Oreg. 97520

Filed Oct. 11, 1989, Ser. No. 420,141

The portion of the term of this patent subsequent to Nov. 7, 2006, has been disclaimed.

Int. Cl.[5] B60H *1/32*

U.S. Cl. 62—239 **17 Claims**



1. A method of travelling with a pet, comprising the steps:

placing the pet in an enclosure;

placing the enclosure in the passenger compartment of a vehicle that includes a vehicle battery;

operating a cooling unit from an electrical energy source independent of said vehicle battery; and

cooling the enclosure with the cooling unit regardless of whether the vehicle engine is on or off.

4,939,912

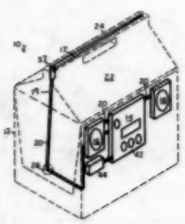
COMBINATION PORTABLE COOLER WITH AUDIO RECEIVER AND PORTABLE COOLER WITH AUDIO SYSTEM

George A. Leonovich, Jr., 270 Communications Way, Hyannis, Mass. 02601

Filed Oct. 26, 1989, Ser. No. 427,196

Int. Cl.[5] F25D *3/08*

U.S. Cl. 62—457.1 **9 Claims**



1. A portable cooler for carrying food and/or beverages comprising:

(A) an insulated container of generally rectangular conventional construction including a coolant packet comprising;

i. an outer shell of generally rectangular construction constructed of a sheet of molded plastic;

ii. an inner shell spaced inwardly and connected to the outer shell forming an intermediate void;

iii. an intermediate layer of insulating material having a composition adapted to permit pouring of the insulating material into the void to fill it during construction of the container;

(B) four adjoining walls, including a first wall and a second wall integrally connected to a base defining a space for storing and carrying items, being kept cool;

(C) an audio unit having an electrical circuit securely mounted in the first wall comprising;

i. a receiver securely attached to the first wall and extending into the void between the outer shell and the inner shell with conventional control knob means extending outwardly through a cutout in the outer shell and being sealably surrounded by the insulating material;

ii. a speaker member securely mounted on the first wall having mounting plate means positioned in the void between the outer shell and the inner shell with screw means extending outwardly through a cut-out in the outer shell and being sealably surrounded by the insulating material;

iii. a power source compartment formed in the void between the outer shell and the inner shell with an opening in the outer shell and being sealably surrounded by the insulating material;

(D) An antenna retractably mounted on the longitudinal handle having a first position in a slot provided in the handle and a second position in perpendicular relation to the handle for receiving transmission signals;

(E) a partially removable top, having hinged cooperation with the container,

(F) a plurality of wire means for connecting the power source compartment to the radio receiver and to the first and second speakers being disposed in the void and sealably surrounded by insulating material.

4,939,913

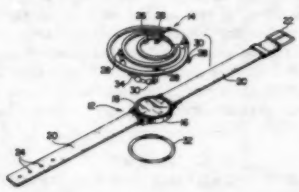
ORNAMENTAL WATCH ACCESSORY

Roger V. Scungio, 15 Roger Rd., Johnston, R.I. 02919, and Melodie A. Betters, 302 Lake Dr., Chepachet, R.I. 02814

Filed May 19, 1989, Ser. No. 354,120

Int. Cl.[5] A44C *25/00*

U.S. Cl. 63—21 **10 Claims**



1. A removable ornament for watches comprising a member adapted to be positioned on top of a watch housing, said member having an opening therein through which the watch face is visible when the ornament is operatively assembled to a watch, said member having an ornamental portion disposed outwardly of said opening, and means carried by said member for releasably attaching same to the watch housing so that the watch face and the opening in the member are in alignment, said attaching means comprising a plurality of posts extending from the underside of said member and adapted to be spaced around the periphery of said watch housing, and a resilient band extending around said posts in order to resiliently retain said member in assembled relation to the watch, said posts having recessed portions for receiving said resilient band, there being four of said posts equally spaced around the periphery of said watch housing, whereby the strap of the watch is adapted

to extend between adjacent posts, and is clamped between the resilient band and the ornamental member.

4,939,914

JIG

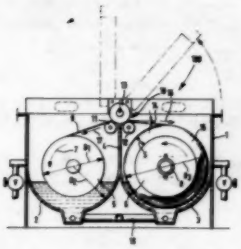
Manfred Driesen; Wolfgang Kurschatke, both of Krefeld, and Johannes Kutz, Tonisvorst, all of Fed. Rep. of Germany, assignors to Eduard Küsters Maschinenfabrik GmbH & Co KG, Krefeld, Fed. Rep. of Germany

Filed Nov. 8, 1984, Ser. No. 669,529

Claims priority, application Fed. Rep. of Germany, Nov. 19, 1983, 3341915

Int. Cl.[5] D06B 15/02

U.S. Cl. 68—22 R 14 Claims



1. A jig for carrying out liquid treatments on a textile web of material, comprising:

two substantially identical, mutually parallel winding rolls disposed approximately at the same height, between which the web of material is rewound;

a housing which comprises two adjacent troughs which have approximately semicircular cross-sections in their lower portions, meet along an approximately equatorial generatrix line, surround the winding rolls concentrically and are adapted to contain treatment liquor;

lines opening into lower regions of the troughs for feeding and discharging treatment liquor and for interconnecting the troughs;

a vertical partition extending up from a zone in which two troughs meet, approximately to an apex of a winding roll containing a full winding; and

a squeezing device for the web of material as it is transferred from one winding roll to the other, above the zone in which the two troughs meet, formed by two first rolls arranged horizontally side-by-side and a second roll resting thereon thereby defining two axially spaced rolling gaps, arranged immediately above the upper edge of the partition in such a manner that the passing web of material runs from the squeezing device downward toward the windings on both sides, the partition having an upper end disposed between the first rolls and an upper edge juxtaposed to a lowermost extent of the second roll, one of the first rolls being disposed above one of the troughs and the other of the first rolls being disposed above the other of the troughs whereby treatment liquor squeezed out of the web at the rolling gap formed above said one trough is prevented from passing into said other trough by the partition.

4,939,915

ELECTROMECHANICAL LOCKING DEVICE

Benno Venlanthen, Zollikofen, Switzerland, assignor to R. Bercht hold AG, Zollikofen, Switzerland

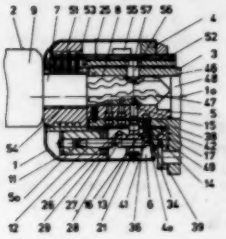
PCT No. PCT/CH88/00025, § 371 Date Oct. 4, 1988, § 102(e) Date Oct. 4, 1988, PCT Pub. No. WO88/05853, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 2, 1988, Ser. No. 278,944

Claims priority, application Switzerland, Feb. 9, 1987, 456/87

Int. Cl.[5] E05B 47/00

U.S. Cl. 70—277 17 Claims



1. An electromechanical locking device including a cylinder lock with a device for transmission of information signals between a lock and a key; a stator housing; a rotor rotatable in said housing; said rotor having an axis and a key channel to receive said key; holding means for mechanically blocking or releasing rotation of said rotor; and an electrically activated blocking device for controlling rotation of said rotor; the improvement comprising: said blocking device (6) having a release bolt (13) directed radially toward said rotor axis (10) and a blocking bolt (14) arranged parallel beside said release bolt (13), an end surface of said release bolt (13) lying against a sliding surface of a holding pin (15) positioned by said key (2) and guided in said rotor (5), said release bolt (13) engaging said blocking bolt (14) through a carrier (16) perpendicular to said release and blocking bolts (13, 14), and in their portions away from rotor (5) is arranged an electric switching element having a magnet anchor (12) with an electric coil (11), said magnet anchor (12) having at least one stop in which one end (40) of said blocking bolt (14) engages, the other end of said blocking bolt (14) engaging in a recess (38) in the rotor (5).

4,939,916

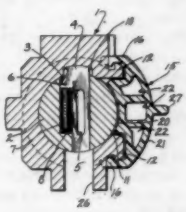
LOCK CONSTRUCTION

Bryan E. Gruenewald, Glendale, and Clayton A. Lokken, Waukesha, both of Wis., assignors to Briggs & Stratton Corporation, Wauwatosa, Wis.

Filed Feb. 1, 1989, Ser. No. 304,705

Int. Cl.[5] E05B 9/04

U.S. Cl. 70—373 10 Claims



1. In a lock construction, a case having a central aperture and having a ward communicating with said aperture, said

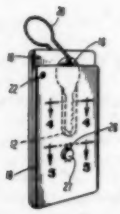
ward having a bottom surface spaced radially outward of said aperture, a cylinder disposed within the aperture and having a central passage, a plurality of plate-like tumblers disposed within the passage and having aligned slots to receive a key, each tumbler having an end disposed to be received in said ward, spring means connecting each tumbler plate at a location spaced from said end and said cylinder for biasing said end outwardly into engagement with the bottom surface of said ward, said case having an opening in a side thereof communicating with the central aperture and spaced circumferentially from said ward, a pair of shoulders bordering opposed sides of said opening, and a cover to enclose said opening, said cover having side flanges constructed and arranged to removably engage the shoulders, said cover being removable from said opening to permit insertion and removal of said tumblers from said cylinder.

4,939,917

KEY CONTROL OF IMPORTANT SECURITY KEYS

Edward V. Cartwright, c/o Philadelphia Electric Co., 2301 Market St., P.O. Box 8699, Philadelphia, Pa. 19101

Filed Dec. 14, 1989, Ser. No. 450,543
Int. Cl.[5] A47G *29/10*
U.S. Cl. 70—456 R **10 Claims**



1. A tamperproof key holder for preventing the unauthorized use of a key contained therein comprising:

a first plate acting as a support for said holder having a routed region located therein for receiving a key;

a second plate superimposed over said first plate acting as a cover for said holder; connecting means between said first and second plates so that access to said key is facilitated, and,

tamperproofing means for determining, upon visual inspection, whether a key contained in said holder has been used.

4,939,918

MONITORABLE AND COMPENSATABLE FEEDBACK TOOL AND CONTROL SYSTEM FOR A PRESS

Daniel A. Schoch, Minster, Ohio, assignor to The Minster Machine Company, Minster, Ohio

Filed Aug. 27, 1987, Ser. No. 90,215
Int. Cl.[5] B30B *15/00*; B21D *22/00*
U.S. Cl. 72—20 **30 Claims**

1. In a press having a tool means, a control system for continuous tool load adjustment comprising:

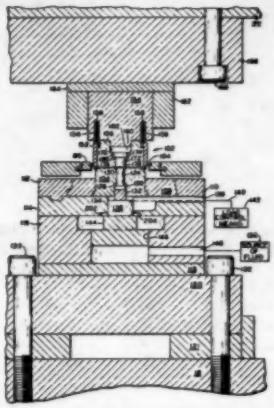
fluid pressure operated back-up load means for providing a variable back-up load to said tool means;

sensing means for sensing the load at said tool means and generating a single sensed back-up load signal indicative of said tool means load;

controller means for receiving an input reference signal and said sensed back-up load signals and providing an output control signal as a function only of said input signals;

a source of fluid at a pressure coupled to said back-up load means; and

a variable fluid pressure circuit means connected to said controller means and coupled between said source of fluid at a pressure and thereby said back-up load means for



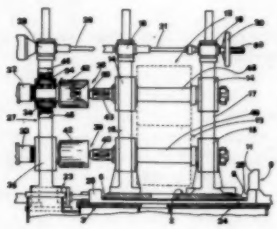
varying dynamically the back-up load to said tool means as a function only of said controller means output signal.

4,939,919

ROLL FORMING MACHINE

Aleardo Chezzi, Boretto, Italy, assignor to OTO MILLS S.p.A., Boretto, Italy

Filed Nov. 29, 1988, Ser. No. 277,660
Claims priority, application Italy, Sep. 23, 1988, 40140 A/88
Int. Cl.[5] B21B *35/14*
U.S. Cl. 72—181 **4 Claims**



1. A roll forming machine, comprising:

a plurality of stands (1) arranged in succession, each supporting at least two forming rolls (12, 13) disposed with axes parallel and mounted to shafts (48, 49) freely journaled at each end to blocks (14, 15) carried by massive uprights (16, 17) and caused to rotate about their respective axes in opposite directions, the axes extending horizontally with one shaft vertically spaced from the other;

at least one base (2), capable of being clamped to and removed from the bed (3) of the machine, to which the uprights (16, 17) of at least one stand (1) are permanently anchored;

at least one fixed upright (27), located a short distance to one side of the uprights of the stand, that carries two power take-off shafts (32, 33) aligned axially with the roll shafts (48, 49) and freely supported in rotation by relative journal blocks (34, 35) at least one of which is mounted to the upright (27) in such a way as to be allowed a marginal degree of shift transverse to the relative axis of rotation, said relative journal blocks being vertically spaced from one another in said fixed upright;

a geared motor unit (30), by which the power take-off shafts (32, 33) are driven;

two couplings (38, 39), by which the power take-off shafts (32, 33) and the roll shafts (48, 49) are caused to rotate as one, each of which consists in two connectable halves (42, 43), turning as one with the power take-off (32 or 33) and with the roll shaft (48 or 49), respectively, the embodiment of which is such that assembly of the coupling will automatically ensure mutual alignment of the axes of the interconnected shafts, wherein the base (2) to which the uprights (16, 17) of the stand (1) are anchored is clamped to and removed from the machine bed (3) by means of a device that comprises:

a horizontal table (4), on which the base (2) rests, and across which it is traversed, guided in a direction parallel to the axes of the power take-off shafts (32, 33);

a fixed stop (5), affording a locating surface (7) inclined to form an acute angle with the surface of the horizontal table (4) and designed to interact with a complementarily angled surface (6) offered by one side of the base (2), against which the base is clamped to the end of ensuring a faultless and predetermined axial position of the roll shafts (48, 49) in relation to the power take-off shafts (32, 33) when being connected thereto by way of the couplings (38, 39);

a movable stop (9), positioned at the side of the base opposite from the fixed stop (5) and affording a locating surface (11) that is inclined to form an acute angle with the surface of the horizontal table (4) and engages a complementarily angled surface (6) offered by the corresponding side of the base (2), said acute angles and the surface of the table forming openings which face one another and face in the direction of movement of the table has been inserted before.

4,939,920

MONITORING DEVICE FOR ROLL BEARINGS IN ROLLING MILLS

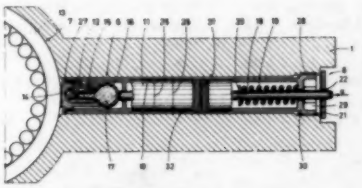
Werner Stahl, Kreuztal, and Axel Barten, Siegen-Sohlbach, both of Fed. Rep. of Germany, assignors to Achenbach Buschhutten GmbH, Kreuztal, Fed. Rep. of Germany

Filed May 11, 1988, Ser. No. 195,682

Claims priority, application Fed. Rep. of Germany, May 22, 1987, 3717316

Int. Cl.[5] B21B *31/00*

U.S. Cl. 72—237 **8 Claims**



1. Monitoring device for roll bearings of work rolls in cluster roll stands of rolling mills, comprising a thermal limit value pickup (6) in contact with a said bearing (7) and being installed in a roll chock (1), and a mechanical, spring-loaded transmission member (8) locked by way of said limit value pickup (6) in said chock (1) to act on a signal generator (9) arranged outside of said chock (1) in a said roll stand (5), this signal generator being activated by automatic outward movement of a transmission member (8) after release from locking means by said limit value pickup (6), upon attainment of a limit temperature of said roll bearing (7), to shut down an associated said rolling mill.

4,939,921

METHOD AND SYSTEM FOR ONE-LINE CALIBRATION AND VALIDATION OF PROCESS INSTRUMENTATION

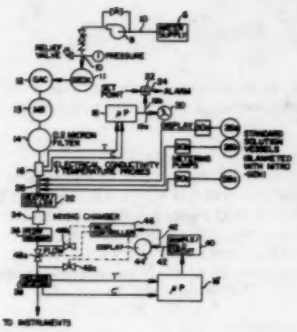
Hudson R. Carter, Alliance, and Eugene T. Upperman, North Canton, both of Ohio, assignors to The Babcock & Wilcox Company, New Orleans, La.

Continuation of Ser. No. 202,090, Jun. 2, 1988, Pat. No. 4,887,453. This application Apr. 18, 1989, Ser. No. 339,757

The portion of the term of this patent subsequent to Dec. 19, 2006, has been disclaimed.

Int. Cl.[5] G01N *27/26*

U.S. Cl. 73—1 R **8 Claims**



1. A method for producing a validating solution for a process instrument measuring the analyte content of a water solution, comprising the steps of:

providing a water supply;

producing pure water from the water supply with an outlet for the pure water;

measuring with a temperature measuring device the temperature of the pure water at the outlet and establishing a signal indicative thereof;

measuring with an electrical conductivity device the electrical conductivity of the pure water at the outlet near the temperature measuring device and establishing a signal indicative thereof;

transmitting the temperature and conductivity signals to a microprocessor for solving a water purity equation and establishing an output signal indicative thereof;

maintaining water purity responsive to changes in the output signal of the microprocessor; and

adding analytes to the pure water to provide a solution suitable for validating the measuring instrument.

4,939,922

METHOD AND DEVICE FOR EXAMINING THE WEAR AND FRICTION PROPERTIES OF SURFACE MATERIALS EXPOSED TO SLIDING FRICTION

Robert J. Smalley, Leerdam, and Maarten Noordman, Hilversum, both of Netherlands, assignors to SKF Industrial Trading and Development Co. B.V., Nieuwegein, Netherlands

Filed Jun. 6, 1988, Ser. No. 203,232

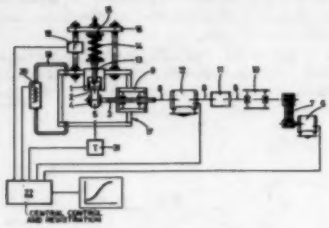
Claims priority, application Netherlands, Jul. 2, 1987, 8701557

Int. Cl.[5] G01N *19/02*

U.S. Cl. 73—10 **9 Claims**

1. Device for examining the sliding friction between exposed surfaces for different combinations of materials, characterized by a holder for a first test piece of a first material, a holder for a second test piece of a second material, driving means for moving the first and second pieces with regard to one another, means for loading the first and second test pieces with regard to one another, means for measuring the energy needed for the

relative displacement between the first and the second test pieces, means for supplying a lubricant to the exposed surfaces



of the first and second test pieces, and means for heating the lubricant and keeping it at a certain temperature.

4,939,923

METHOD OF RETROFITTING A PRIMARY PIPELINE SYSTEM WITH A SEMI-RIGID PIPELINE

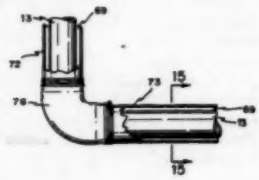
Bruce R. Sharp, 7685 Fields-Ertel Rd., Cincinnati, Ohio 45241

Division of Ser. No. 198,454, May 25, 1988, Pat. No. 4,870,856. This application Oct. 3, 1989, Ser. No. 416,603

The portion of the term of this patent subsequent to May 26, 2004, has been disclaimed.

Int. Cl.[5] G01M *3/08*

U.S. Cl. 73—40.5 R **6 Claims**



1. A method of retrofitting a primary pipeline system having at least one junction to provide secondary containment, comprising the steps of:

(a) disconnecting a portion of the primary pipeline;

(b) sliding a semi-rigid pipeline over said disconnected primary pipeline;

(c) sliding the secondary semi-rigid pipeline over another section of an adjoining primary pipeline section;

(d) positioning a split fitting over the same or a second junction for said secondary semi-rigid pipeline sections, said split fittings comprised of (i) a pair of housing halves such that when mated and secured together a complete housing enclosure is formed which has at least two extremities with openings through which the primary pipeline passes, and said housing enclosure being capable of enclosing a portion of the pipeline and capable of having the secondary pipeline held to the extremities by clamping means, (ii) sealing means positioned on each mated surface to form a liquid tight seal between the housing halves, and (iii) a clamping means;

(e) mating said housing halve to form a housing enclosure;

(f) attaching said semi-rigid pipeline sections to the housing enclosure;

(g) clamping the secondary semi-rigid pipeline sections to the housing enclosure with a clamping means to form a liquid tight seal;

(h) reconnecting the disconnected portion of the primary pipeline to the junction; and

(i) attaching ends of said secondary pipeline sections to form a closed space providing the secondary containment.

4,939,924

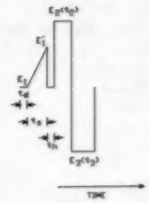
PULSED COULOMETRIC DETECTION WITH AUTOMATIC REJECTION OF BACKGROUND SIGNAL IN SURFACE-OXIDE CATALYZED ANODIC DETECTIONS AT GOLD ELECTRODES IN FLOW-THROUGH CELLS

Dennis C. Johnson, Ames, Iowa, and Glen G. Neuburger, Freehold, N.J., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Sep. 26, 1988, Ser. No. 249,614

Int. Cl.[5] G01N *27/42, 30/62*

U.S. Cl. 73—61.1 C **10 Claims**



10. The method of liquid chromatography quantitative analysis of a plurality of multiple chemical components in a liquid sample solution, said method comprising

flowing said solution through chromatographic separation means and separating said components upon elution therefrom,

passing the effluent from said chromatographic means through a flow-through cell wherein an electric potential is applied to a working electrode, and

electrochemically detecting the separated chemical components in the cell using a cyclic pulsed coulometric detection technique having a potential sweep or a potential step function of a certain time period of duration, said method including the steps of applying current integration over the time period of said cyclic potential sweep.

4,939,925

METHOD OF PERFORMING MEASUREMENT OF HEMATOCRIT VALUE AND SEPARATE SAMPLING OF BLOOD COMPONENT

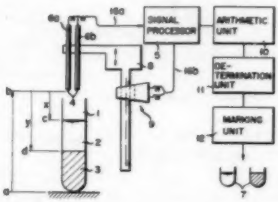
Hajime Sakuma, Hachioji; Toshiyuki Sasaki, Fussa, and Katsumi Komatsu, Tokyo, all of Japan, assignors to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Mar. 13, 1989, Ser. No. 323,568

Claims priority, application Japan, Mar. 23, 1988, 63-68739

Int. Cl.[5] G01N *33/49*

U.S. Cl. 73—61.4 **7 Claims**



1. A method of performing measurement of a hematocrit

value and separate sampling of first and second blood components, comprising the steps of:

lowering a probe from a predetermined initial height into a predetermined sample vessel containing a blood sample separated into a first component layer as an upper layer and a second component layer as a lower layer, the probe being integrally formed with a liquid surface detection electrode and a suction nozzle;

monitoring a descent distance upon descent of said probe;

generating a first liquid surface detection signal from said liquid surface detection electrode when a distal end of said probe reaches a liquid surface of the first component layer;

sampling a predetermined amount of the first component into separate sampling vessel means through said suction nozzle of said probe in response to the first liquid surface detection signal;

generating a second liquid surface detection signal from said liquid surface detection electrode when the distal end of said probe reaches a liquid surface of the second component layer;

sampling a predetermined amount of the second component into the separate sampling vessel means through said suction nozzle of said probe in response to the second liquid surface detection signal;

calculating liquid surface heights of the first and second component layers on the basis of the initial height of said probe, the monitored descent distance of said probe, and the first and second liquid surface detection signals; and

calculating a total volume of the blood sample and a volume of the second component on the basis of the liquid surface heights of the first and second component layers, and calculating a hematocrit value from the volumes.

4,939,926

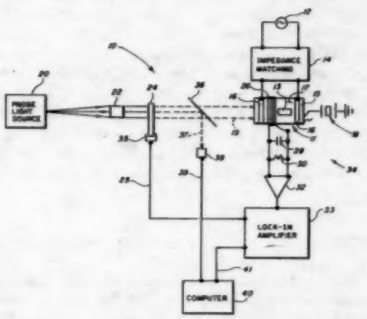
APPARATUS AND METHOD FOR MONITORING PRESSURE LEAKS FROM A SEALED SYSTEM

Jeanne A. Welch, Laurel, Md., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Jun. 5, 1989, Ser. No. 361,074

Int. Cl.[5] G01M *3/40*

U.S. Cl. 73—49.3 **14 Claims**



14. A method for monitoring pressure changes associated with a sealed system that may leak, the method comprising the steps of:

establishing an ionizing discharge in association with the sealed system,

irradiating the established ionizing discharge with probe radiation from a radiation source,

providing signals representing monitored current flow through the ionizing discharge in response to the probe irradiating of the discharge,

providing signals representing monitored probe radiation prior to irradiating the ionizing discharge,

computing data representing pressure changes due to leaks from the sealed system based on the signals representing monitored current flow through the ionizing discharge and based on the signals representing monitored probe radiation whereby computed pressure changes are normalized with respect to changes in the radiation source.

4,939,927

DEVICE TO MEASURE THE TENDERNESS OF MEAT

Geoffrey Johnston, "Claremont", Bega, New South Wales, Australia 2550

PCT No. PCT/AU87/00298, § 371 Date Jun. 6, 1988, § 102(e) Date Jun. 6, 1988, PCT Pub. No. WO88/01742, PCT Pub. Date Mar. 10, 1988

PCT Filed Aug. 31, 1987, Ser. No. 236,523

Claims priority, application Australia, Sep. 3, 1986, PH7822

Int. Cl.[5] G01N *3/42*

U.S. Cl. 73—81 **9 Claims**

1. A meat probe to aid in determining the tenderness of meat, said probe comprising:

a generally cylindrical body having a forward end having formed therein an aperture through which projects an elongated probe member, the probe member having a first piston directly affixed thereto, the first piston reciprocable within the body;

a second piston reciprocable within the body, the second piston having attached thereto a piston rod, the rod extending beyond a rear end of the cylindrical body opposite the forward end;

a resilient means interposed between the first and second pistons within the body;

the rear end of the body housing a means for advancing the piston rod and a means for releasing the piston rod;

the body having exterior calibrated markings which cooperate with a portion of the second piston to indicate the advancement of the second piston within the body.

4,939,928

METHOD OF DETERMINING THE CONTINUITY OF SOLENOIDS IN AN ELECTRONIC AUTOMATIC TRANSMISSION SYSTEM

Keith B. Carle, Hartland; Thomas Glowczewski, Washington Township, Macomb County; Gerald L. Holbrook, Rochester Hills; William R. Kissel, Milford; Maurice B. Leising, Clawson, and Michael R. Lindsay, Livonia, all of Mich., assignors to Chrysler Corporation, Highland Park, Mich.

Continuation of Ser. No. 188,607, Apr. 29, 1988, abandoned. This application Jun. 15, 1989, Ser. No. 366,361

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **16 Claims**

15. In a vehicle transmission including an input member, an output member, a torque converter assembly for transmitting torque between an engine and the input member, a gear assembly for changing the ratio of torque between the input member and output member, a plurality of frictional units to shift the gear assembly, at least one solenoid-actuated valve being actuated in response to the presence or absence of electrical power to the valve for directing fluid flow between a fluid source and at least one of the frictional units, input sensors providing input

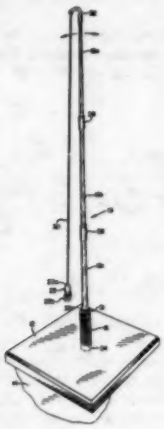
signals of predetermined conditions, a controller for processing the input signals and providing output signals to control the solenoid-actuated valves, a method of determining the electrical continuity of solenoids for solenoid-actuated valves in the vehicle transmission, said method comprising the steps of;

checking whether at least one predetermined event is occurring;

executing a solenoid test to determine the continuity of a plurality of solenoids based on the at least one predetermined event;

determining whether a predetermined solenoid is under test;

checking whether a torque converter in the transmission is being partially locked to the engine if a solenoid is under test;



turning on the solenoid under test if the method is at the start of a partial lockup period for the torque converter;

turning off the predetermined solenoid under test;

determining whether a spike response was received by the controller;

pointing to the next solenoid to be tested if a spike response was received by the controller;

determining whether all of the solenoids of the solenoid-actuated valves were tested; and

ending the test if all of the solenoids of the solenoid-actuated valves were tested, otherwise continuing the test for the next solenoid to be tested.

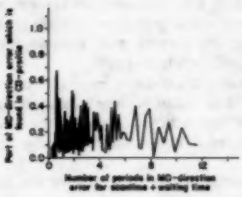
4,939,929

MEASUREMENT OF THE PROPERTIES OF A WEB IN PAPER PRODUCTION

Leif T. Östman, Spånga, Sweden, assignor to STFI, Stockholm, Sweden

Filed Dec. 8, 1988, Ser. No. 281,386
Int. Cl.[5] G01N *33/34, 33/44*
U.S. Cl. 73—159 **6 Claims**

1. A method of measuring variations in the properties of a continuously running paper web comprising indication of the paper properties by reciprocating a scanning device across the web, wherein movement of the scanning device is time controlled, so that said movement is out of phase with periodical



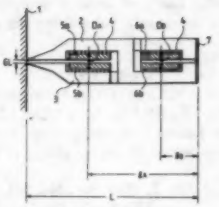
variation of the paper properties in the longitudinal direction of the web.

4,939,930

ELECTRIC CAPACITANCE STRAIN GAUGE

Toshio Ishizuki; Yoshio Fukada, both of Hitachi, and Ken-ichi Honda, Katsuta, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Naka Electronics Co., Ltd., Ibaraki, both of, Japan

Filed Apr. 13, 1989, Ser. No. 336,784
Claims priority, application Japan, Apr. 13, 1988, 63-89085
Int. Cl.[5] G01L *1/00*
U.S. Cl. 73—780 **3 Claims**



1. An electric capacitance strain gauge provided with a pair of installing frames connected with each other, electrical insulating members with a stepped shape fixed on said pair of installing frames by insertion, and two pairs of electrode plates with a stepped shaped fixed onto said electrical insulating members by insertion, characterized in that a member for connecting the installing frames which constitutes a pair is a plate spring deposited at the end of each of said installing frames, and that a stepped part for positioning the plate spring is provided at the end surface of said installing frames.

4,939,931

RESIDENTIAL WATER METER WITH INTEGRAL FIRE HYDRANT

Kenneth Reeves, 102 Valleyview Dr., Old Hickory, Tenn. 37138

Continuation-in-part of Ser. No. 309,708, Feb. 2, 1989, abandoned. This application Dec. 12, 1989, Ser. No. 448,881
Int. Cl.[5] G01F *15/00*
U.S. Cl. 73—201 **12 Claims**

1. A residential water meter and integral fire hydrant unit comprising:

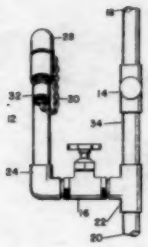
(a) an input means connecting said device to a water line;

(b) an output means connecting said device to a home water system;

(c) a dividing means diverging water flow between said output and a hydrant;

(d) a meter means measuring flow of water between said input means and said dividing means;

(e) valve means preceding said hydrant to control flow through said hydrant; and



(f) where said device is pre-assembled as a unit and is adapted for installation in place of a standard residential water meter assembly.

4,939,932

LEVEL MEASURING DEVICE

Hugo Ritzenthaler, Rochester Hills, and Scott Polando, Lake Orion, both of Mich., assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 28, 1989, Ser. No. 330,594
Int. Cl.[5] G01F *23/32*
U.S. Cl. 73—317 **7 Claims**

1. A level measuring device for measuring the level of the liquid in a container, the device comprising

an elongated support which extends approximately horizontally into the container and includes a first end and a second end opposite the first end, the support being fastened at its first end to a wall of the container while the second end of the support rests under intial spring pressure against a bottom of the container;

a carrier fixed to the support between the first and the second ends of the support;

a mechanical-electrical transducer supported by the carrier and having a lever mounted pivotally to the transducer, there being a float carried by the lever for controlling the transducer; and wherein

the support is formed as an elongated member, the elongated member being bent in the manner of a coil having at least one turn in a region between the carrier and said first end of the support, the coil functioning as an elastic spring; and

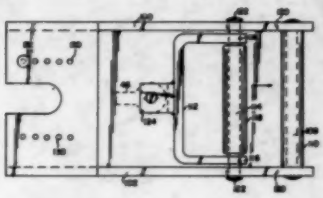
a plane of said at least one turn is approximately vertical and parallel to a vertical plane containing said first and said second ends fo the support.

4,939,933

ISOMETRIC STRENGTH TESTING METHOD AND EQUIPMENT FOR DISABILITY EVALUATION

Thomas M. Curran, 464 Springbrook, Saline, Mich. 48176

Division of Ser. No. 92,432, Sep. 3, 1987, Pat. No. 4,882,677.
This application Sep. 19, 1989, Ser. No. 409,250
Int. Cl.[5] A61B *5/22*
U.S. Cl. 73—379 **17 Claims**



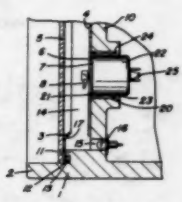
5. An isometric strength testing unit comprising a vertical post, a horizontal arm on the post, said arm selectably positionable on the post, a squeeze grip attachment on the arm, said squeeze grip attachment comprising a frame having two parallel members, an outboard frame bar joining the parallel members, a bifurcated handle positioned between the parallel members, said handle movable relative to the parallel members, a handle bar extending between the ends of the bifurcated handle, means on the handle engageable with the parallel members and means on the parallel members to guide movement of the handle relative to the frame bar and sensing means attached to the handle.

4,939,934

COMBINATION INSTRUMENT

Hugo A. Ritzenthaler, Rochester Hills, Mich., and Martin Haub, Winchester, Va., assignors to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 300,099
Int. Cl.[5] G01D *11/24*
U.S. Cl. 73—431 **17 Claims**



1. A combination instrument, particularly for motor vehicles, including an instrument holder on which several display units can be mounted, and comprising further a cover glass which covers all of the display units jointly and is arranged in front of the instrument holder on the side towards the observer; and wherein

the display units are mountable on the instrument holder from the side facing away from the observer;

further comprising stops arranged on the instrument holder, there being mounted openings in the holder;

wherein the display units are inserted into the mounting openings of the instrument holder until the stops;

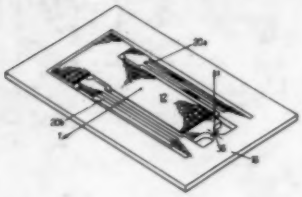
the display unit is provided, on a circumferential surface thereof, with elastic ribs which protrude radially more than the radial size of the mounting opening.

4,939,935

PENDULAR NON-SERVOED TUNING BEAM ACCELEROMETER

Yvon Amand, Soisy Sous Montmorency, France, assignor to Societe d'Applicatioes Generales d'Electricite et de Mecanique, Paris, France

Filed Feb. 21, 1989, Ser. No. 312,753
Claims priority, application France, Feb. 22, 1988, 88 02079
Int. Cl.[5] G01P *15/10*
U.S. Cl. 73—517 AV **7 Claims**



1. Pendular accelerometer comprising a base, a pendular seismic mass of flat shape connected to the base by a flexure hinged connection for pivotal movement of said seismic mass about a hinge axis perpendicular to major surfaces of said pendular seismic mass, along a sense direction perpendicular to the hinge axis of the hinged connection and sensor means connecting the seismic mass to the base, wherein said sensor means comprises:

at least two vibrating beams of piezo-electric material, each connected to the base at an end thereof and to the seismic mass at the other end thereof, and each provided with electrode means for vibrating the respective beam at a tuning frequency thereof, said beams being directed orthogonally to the same axis and being located symmetrically with respect to the seismic mass on both sides of the hinge axis of the hinged connection, whereby any acceleration along the sense axis creates tractive stresses in one beam and compression stresses in the other beam, and

circuit means connected to the electrodes and arranged for delivering a signal which is responsive to the difference between the resonant frequencies of the two beams when said seismic mass is subjected to an acceleration.

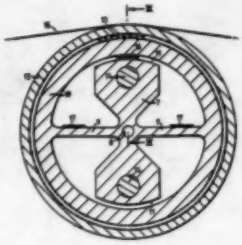
4,939,936

SHAPEMETER

Peter D. Spooner, Northwood, and Colin A. Scottow, High Wycombe, both of Great Britain, assignors to Protos Precision Systems Limited, Watford, United Kingdom

PCT No. PCT/GB87/00206, § 371 Date Oct. 21, 1988, § 102(e) Date Oct. 21, 1988, PCT Pub. No. WO87/05837, PCT Pub. Date Oct. 8, 1987
PCT Filed Mar. 25, 1987, Ser. No. 250,682
Claims priority, application United Kingdom, Mar. 27, 1986, 8607729
Int. Cl.[5] G01L *5/10*; G01B *7/28*
U.S. Cl. 73—862.07 **4 Claims**

1. A rotor module for a shapemeter comprising a central arbor secured to a non-rotatable ring surrounding the arbor and an outer hollow cylinder rotatable on bearings on the ring in which the arbor is secured to the ring solely by two webs which are in substantial alignment and means to detect relative movement between the arbor and the ring in response to a force applied to the cylinder at such a position as to cause the webs to bend in order to provide output signals representative of such movement and in which said means detects a variation



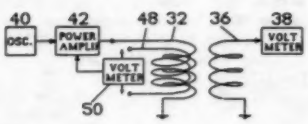
in a gap between the ring and the arbor at a location adjacent said position.

4,939,937

MAGNETOSTRICTIVE TORQUE SENSOR

Robert D. Klauber, and Erik B. Vigmostad, both of Fairfield, Iowa, assignors to SensorTech, L. P., Fairfield, Iowa

Filed Jul. 21, 1988, Ser. No. 222,838
Int. Cl.[5] G01L *3/10*
U.S. Cl. 73—862.36 **21 Claims**



1. A method for sensing torque comprising:

inducing a primary magnetic induction field flux in a torque transmitting element,

obtaining a signal which depends on a secondary magnetic induction field flux in said torque transmitting element whose secondary magnetic field direction arises at a non-zero angle from the primary magnetic field as a result of magnetostriction when torque is transmitted by the torque transmitting element, and

maintaining the primary magnetic induction field flux at effectively constant amplitude,

whereby the secondary magnetic induction field flux is affected minimally by non-torque induced variations in magnetic permeability in the torque transmitting element and the signal which depends on the secondary magnetic induction field flux is thereby used to determine the torque transmitted.

4,939,938

LOAD TRANSMITTING DEVICE FOR ELECTROMECHANICAL MEASUREMENT TRANSDUCERS

Arne Söderholm, Bromma, Sweden, assignor to S.E.G. Resistor AB, Vallingby, Sweden

Filed Jan. 31, 1989, Ser. No. 304,260
Claims priority, application Sweden, Feb. 2, 1988, 8800313-2
Int. Cl.[5] G01L *1/26*
U.S. Cl. 73—862.38 **18 Claims**

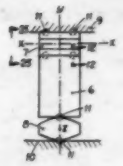
1. An apparatus for measurement of forces, comprising:

measuring means for measuring a load, having two substantially parallel end planes;

first and second transmitting unit for transmitting forces corresponding to said load into said measuring means; said

first transmitting unit contacting one said end plane of said measuring means and said second transmitting unit contacting the other end plane of said measuring means;

each said first and second transmitting unit having a longitudinal axis parallel to said end planes and perpendicular to each other;



each said first and second transmitting unit also including two curved surface portions one on either side of a plane parallel to said end planes;

all points on each said curved surface portion being the same distance R away from an axis parallel to the longitudinal axis of a corresponding transmitting unit; said distance R being greater than half the height of each transmitting unit in a direction perpendicular to its longitudinal axis.

4,939,939

APPARATUS FOR MEASURING A TRACTION FORCE BY MEANS OF A TRACTION DYNAMOMETER

Helmut Vemmer, Wuppertal, Fed. Rep. of Germany, assignor to Peter Lancier Maschinenbau-Hafenhuette GmbH & Co.,KG, Muenster-Wolbeck, Fed. Rep. of Germany

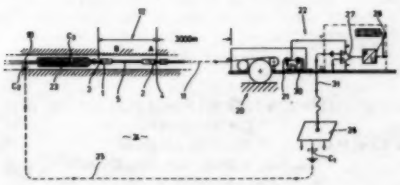
PCT No. PCT/EP88/00208, § 371 Date Nov. 8, 1988, § 102(e) Date Nov. 8, 1988, PCT Pub. No. WO88/07184, PCT Pub. Date Sep. 22, 1988

PCT Filed Mar. 16, 1988, Ser. No. 283,485

Claims priority, application Fed. Rep. of Germany, Mar. 18, 1987, 3708748

Int. Cl.[5] G01L *5/10*

U.S. Cl. 73—862.44 **14 Claims**



1. Apparatus for measuring a traction force which is measured during a cable-laying comprising: a traction dynamometer disposed between a cable and a conductive traction rope, the dynamometer including a force measuring sensor and a measuring circuit which amplifies the signals received from the force measuring sensor and converts them to frequency-modulated, traction-force-proportional measurement signals, a measurement receiver, the measurement signals being fed to the measurement receiver, the traction rope incorporating a first conductor to the measurement receiver and the ground incorporating a second conductor, the output of the measurement circuit, which is connected to the conductor carried through the ground, transferring the measurement signals through the ground to the measurement receiver with a capacitive coupling galvanically separated from the ground.

4,939,940

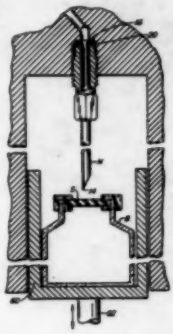
POST-ACCIDENT SAMPLE S. ATION NEEDLE SEAL

Robert S. Tsukida, San Jose, Calif., assignor to General Electric Company, San Jose, Calif.

Filed Jan. 17, 1989, Ser. No. 296,993

Int. Cl.[5] G01N *1/20*

U.S. Cl. 73—864.74 **3 Claims**



1. A needle assembly for sealing to a bore, the bore including a bottom surface; a passageway penetrating centrally of the bottom surface; a smooth cylindrical bottom extending from the bottom surface part way to and towards the opening of the bore; and female threads for receiving a needle retaining nut at complementary male threads, the improved needle assembly comprising;

a needle having a point at one end and an outward flare at the opposite end;

a resilient O-ring threaded over the end of said needle and captured at the flare of said needle at the end of said needle opposite said point;

a needle nut having a compression portion, a male threaded portion for mating to the female threads of said bore, and a socket portion for enabling securing of said needle interior of said bore;

said O-ring dimensioned with respect to said flare to fit interiorly of said bore without interference of the side walls thereof;

said O-ring having sufficient resiliency to expand in circumferential diameter beyond the edges of said flare for effecting a first seal between said flared needle end and said O-ring and effecting a second seal between said bore and said O-ring;

said O-ring effecting a self-centered seal for maintaining said seal under repeated, columnar impacts of said needle a respective septums for the deposit of radioactive sample in respective bottles without leaks.

4,939,941

COMBINED DISTANCE AND DIAMETER MEASURING APPARATUS FOR WHEEL BALANCING MACHINE

Robert Cellucci, Danville; Duncan R. MacKay, Sunnyvale, and Allan C. Madden, Woodside, all of Calif., assignors to Coats Wheel Balancer Corp., Milpitas, Calif.

Filed Sep. 9, 1988, Ser. No. 243,075

Int. Cl.[5] G01B *5/08, 5/14, 7/00*; G01D *21/02*

U.S. Cl. 73—865.8 **5 Claims**

1. An apparatus for measuring both the diameter of an object having a plane with a substantially circular shape in said plane and the distance of the object from said plane to a reference plane comprising:

a major arm having an axis and two ends, with a non-circular shape along a cross-section of said axis;

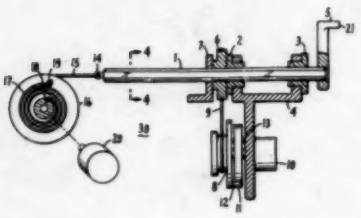
a first stationary support bearing and a second stationary

support bearing for support said major arm along its axis such that said arm is axially slidable and rotatable;

a minor arm attached to a first end of said major arm for rotating said major arm;

a first pulley, adjacent to one of said support bearings, with a central hole, having substantially the same cross-sectional shape as the cross-sectional shape of said major arm, such that said major arm can slide through said first pulley without moving said first pulley, and rotate said first pulley as said major arm rotates;

a first rotational transducer for converting rotational movement into a first electrical signal;



first means for connecting said first pulley to said first rotational transducer;

means for biasing said first rotational transducer to urge it to a resting position;

a second rotational transducer for converting rotational movement into a second electrical signal;

means for translating the axial movement of said major arm into a rotational movement; and

second means for connecting said translating means to said second rotational transducer.

4,939,942

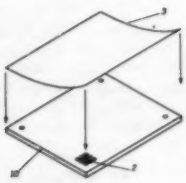
METHOD FOR MEASURING THE ACCURACY OF INSERTION EQUIPMENT

John R. Thome, Fort Worth, and Sypyng B. Yu, Hurst, both of Tex., assignors to Motorola, Inc.

Filed Aug. 3, 1989, Ser. No. 389,237

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—865.9 **9 Claims**



1. A method to characterize parametrically the accuracy of component insertion equipment, comprising the steps of:

(a) providing a test board with a plurality of cavities that are covered by a film and arranged in a known pattern to coincide with the components to be inserted;

(b) inserting the component leads through the film and into the cavities on the test board according to a desired pattern;

(c) removing the component leads from the test board;

(d) measuring the location of the resulting holes in the film caused by the insertion of the component leads; and

(e) comparing said measured locations to said desired pattern.

4,939,943

SAMPLE INJECTOR FOR A LIQUID CHROMATOGRAPH

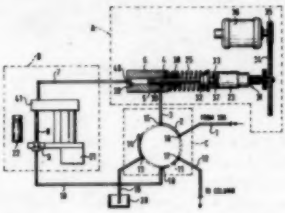
Fred Strohmeier, Rheinmuenster, Fed. Rep. of Germany, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Feb. 2, 1989, Ser. No. 305,888

Claims priority, application European Pat. Off., Feb. 11, 1988, 88102007

Int. Cl.[5] B01L *3/02*

U.S. Cl. 73—864.21 **12 Claims**



1. A sample injector for a liquid chromatograph comprising:

metering means having a bore, a piston, an inlet/outlet port, and a solvent inlet port;

an inlet/outlet conduit in liquid communication with said bore through said inlet/outlet port;

sample intake means adapted for admitting liquid sample into said inlet/outlet conduit so that at least partially withdrawing said piston can cause said liquid sample to move along said inlet outlet conduit toward said bore;

a discharge conduit for transferring said liquid sample to a chromatographic column, said discharge conduit being connectable to said inlet/outlet conduit; and

solvent introduction means for introducing solvent into said bore through said solvent inlet port while said discharge conduit is connected to said inlet/outlet conduit so that said liquid sample can be transported by solvent through said inlet/outlet conduit, through said discharge conduit, and, thence, onto said chromatographic column;

whereby said liquid sample can be drawn towards said metering means by at least partial withdrawal of said piston, and said liquid sample can be transported to said column by action of solvent while said piston is at least partially withdrawn, and whereby said metering means is flushed by solvent while said liquid sample is transported.

4,939,944

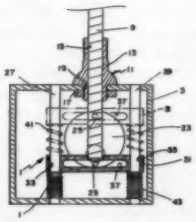
TRANSMISSION MECHANISM FOR MUSIC BOX ORNAMENT

Jack Hou, P.O. Box 78-95, Taipei, Taiwan

Filed Jun. 9, 1988, Ser. No. 204,507

Int. Cl.[5] A63J *31/00*

U.S. Cl. 74—49 **7 Claims**



1. A mechanism for transmitting the power output of a

power drive source to an ornament for imparting a desired movement thereto, which mechanism comprises:

(a) a drive wheel for rotation by a power output shaft of a power drive source, the drive wheel including an eccentrically disposed drive stub secured thereto;

(b) a pair of stationary parallel guide rods;

(c) a slide link provided with a longitudinal slot engageable by the drive stub and a pair of spaced holes therethrough at opposite ends of the link, each hole being configured and sized for slidably receiving a guide rod therethrough to support and guide the link during reciprocating movement along the guide rods;

(d) a tappet rod for supporting an ornament at one end thereof, with the other end of the tappet rod being rotatably secured to the drive stub; and

(e) whereby when the drive wheel is rotated, the slide link is caused to reciprocate along the guide rods and the drive stubs imparts simulataneous reciprocating and pivoting movements to the tappet rod.

4,939,945

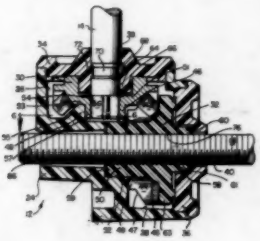
GEARBOX DRIVE SYSTEM WITH PLASTIC OUTPUT GEAR

Francis E. Ryder, and Stephen P. Lisak, both of Arab, Ala., assignors to Ryder International Corp., Arab, Ala. and Textron Inc., Providence, R.I., a part interest

Filed Apr. 13, 1989, Ser. No. 337,298

Int. Cl.[5] B60Q *1/06*; F16H *25/24, 1/14*

U.S. Cl. 74—89.13 **23 Claims**



1. An adjustment mechanism for a headlamp or the like, said adjustment mechanism having a pair of bevel gears with intermeshing teeth for transforming rotational force exerted on a drive member operatively attached to a drive gear of said pair of bevel gears to rotate an adjustment gear of said pair of bevel gears which generally linearly moves a threaded adjustment member operatively coupled with said adjustment gear, said adjustment mechanism comprising; a housing member having formed therein a first gear receiving chamber and a second gear receiving chambers, said first and said second gear receiving chambers generally intersecting within said housing member, said drive gear being positioned in said first gear receiving chamber and cooperatively engaging said adjustment gear which is positioned in said second gear receiving chamber, wherein one of said pair of bevel gears is a plastic gear and the other of said pair of bevel gears is metal said plastic gear having teeth thereon that are integrally formed having a circumferential width that is significantly greater than the circumferential width of the teeth on said metal bevel gear member, such that said integrally formed teeth on the plastic gear can withstand the load and deflection forces imposed thereon by the metal gear teeth.

4,939,946

COMPOSITE MOTION GUIDE DEVICE

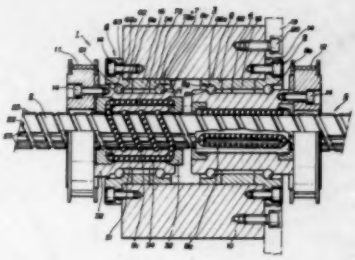
Hiroshi Teramachi, 2-34-8, Higashi-Tamagawa, Setagaya-Ku, Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 185,168

Claims priority, application Japan, Mar. 5, 1988, 63-52460

Int. Cl.[5] F16H *25/22*

U.S. Cl. 74—89.15 **9 Claims**



1. A composite motion guide device comprising:

a single shaft means provided with helical ball screw grooves formed in an outer peripheral surface thereof and ball spline grooves formed in the outer peripheral surface thereof so as to extend in an axial direction of the shaft across the ball screw grooves, the respective ball screw grooves and ball spline grooves having groove depths equal to each other;

a ball screw nut mounted on said shaft means and provided with ball rolling grooves being engageable with said ball screw grooves through loaded balls;

a hollow ball spline outer cylinder mounted on said shaft means and provided with ball rolling grooves being engageable with said ball spline grooves through loaded balls;

a retainer means disposed in a bore of said spline outer cylinder, said retainer means being of a thin walled cylindrical form and having slits disposed facing the ball rolling grooves, the slits having opposed curved surfaces for receiving and guiding loaded balls in the longitudinal direction of the shaft, the opposed surfaces being defined by a diameter substantially equal to a diameter of the loaded balls;

a number of balls rolling in said ball screw grooves and ball spline grooves;

means for independently driving said nut and said spline outer cylinder from each other;

means for pre-loading the balls interposed between said nut and said shaft means in an axial direction thereof;

means for pre-loading balls incorporated in said support bearing in support of said nut; and

means for pre-loading balls interposed between said spline outer cylinder and said shaft means in a substantially rotating direction thereof.

4,939,947

RACK AND PINION TYPE STEERING APPARATUS

Hiromitsu Toyoshima; Hirokazu Yoneda; Hiroshi Ueno, and Shoji Hatabu, all of Osaka, Japan, assignors to Koyo Seiko Co., Ltd., Osaka, Japan

Filed May 15, 1989, Ser. No. 351,907

Claims priority, application Japan, May 17, 1988, 63-64816[U]

Int. Cl.[5] B62D *3/12*

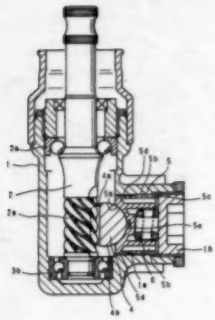
U.S. Cl. 74—422 **6 Claims**

1. A rack and pinion type steering apparatus comprising:

a rack shaft with a circumferential surface which is engaged with a pinion shaft;

a housing which houses said rack shaft, wherein a bore is formed at a first side with no rack of said rack shaft in the direction perpendicular to said rack shaft; and

a cylindrical rack guide made of synthetic resin, which has taper-form ribs, is loosely fitted into said bore, has a first



end surface in an axial direction formed to be a recess being contacted by the circumferential surface of said rack shaft, and is biased in order to press said rack shaft against the pinion shaft,

said taper-form ribs extending from a topmost portion of both outer sides of said first end surface of said rack guide toward a second end surface in the axial direction of said rack guide.

4,939,948

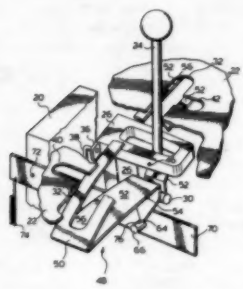
ON THE GO GEAR SHIFTER

Kenneth W. Stittle, Brampton, Canada, assignor to Noma Outdoor Products Inc., Brampton, Canada

Filed Sep. 5, 1989, Ser. No. 402,287

Int. Cl.[5] B60K *41/22*

U.S. Cl. 74—473 R **8 Claims**



1. In an apparatus including:

a prime mover;

a drive train including a friction gear and a member driven thereby;

a gear shift handle;

means mounting said gear shift handle for movement along a path for varying the ratio of said friction gear;

a plurality of detent openings locating along said path, said mounting means permitting the engagement of said gear shift handle into selected detent openings for retaining selected gear ratios;

a clutch link movable between first and second positions respectively to couple and uncouple said driven member from said drive train;

the improvement wherein ones of said detent openings locate on transversely opposed sides of said path, and wherein over-centre toggle means is provided operatively interconnecting said clutch link and said gear shift handle so as to move said clutch link to said second position as said gear shift handle is moved out of engagement with a detent opening under the influence of a manually applied force, and to bias said gear shift handle into said detent openings upon release of said manually applied force, while simultaneously permitting the return of said clutch link to said first position.

4,939,949

PLANETARY OVERRIDING GEARING AND OVERRIDING DRIVING FOR CHAIN BELTS AND THE LIKE, PARTICULARLY FOR CHAIN CONVEYORS AND CHAINDRAWN MINING MACHINES

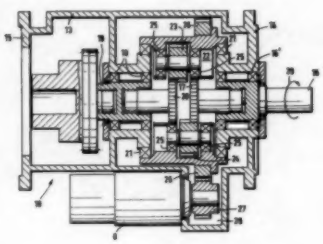
Werner Langenberg, Werne, Fed. Rep. of Germany, assignor to Gewerkschaft Eisenhutte Westfalia GmbH, Fed. Rep. of Germany

Filed Feb. 2, 1989, Ser. No. 305,786

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804168

Int. Cl.[5] F16H *37/06*

U.S. Cl. 475—2 **12 Claims**



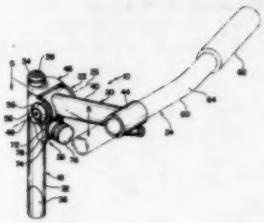
1. In a drive system for propelling an endless traction member of a mineral mining installation having main and auxiliary drives each composed of an electric asynchronous drive motor and a gearing unit; the improvement comprising a planetary gearing unit interposed between at least one of the motors and an associated gearing unit, a further control motor operably associated with the planetary gear unit, the planetary gearing unit comprising an input shaft with a first sun wheel, an output shaft with a second sun wheel, sets of planet wheels meshing with the respective first and second sun wheels with planet wheels of one set also meshing with planet wheels of the other set, a common carrier for the sets of planet wheels, means drivably coupling the carrier to the control motor and means for sensing a load parameter derived from loading of at least one of the drive motors and indicative of imbalance between the drives and for operating the control motor to rotate the carrier; whereby the sensing means and the control motor co-operate to regulate the planetary gearing drive ratio from a value of 1:1 when the control motor is inoperative to cause the planetary gearing to override the drive ratio of said associated gearing to compensate for the sensed load parameter.

4,939,950

HANDLEBAR ASSEMBLY FOR CYCLES

Robert H. Girvin, Holliston, Mass., assignor to K G Engineering, Inc., Woonsocket, R.I.

Filed Oct. 24, 1988, Ser. No. 261,556
Int. Cl.[5] B62K *21/14*
U.S. Cl. 74—551.2 24 Claims



1. A handlebar assembly for use in connection with a cycle having a steering column axis, said handle bar assembly comprising:

a. a column member adapted to be rotatably mounted on said cycle so that said column member is disposed in substantially coaxial relation with said steering column axis;

b. a pivot arm;

c. means for mounting said pivot arm on said column member so that said pivot arm extends forwardly therefrom, and so that said pivot arm is downwardly pivotable about a pivot axis which is substantially perpendicular to said steering column axis;

d. a handlebar element mounted on said pivot arm at a location which is spaced forwardly from said pivot axis, said handlebar element including a pair of hand gripping portions which are adapted to be grasped by the hands of an operator of said cycle, said hand gripping portions being spaced forwardly from both said pivot axis and said steering column axis; and

e. means for resiliently resisting pivoting movement of said pivot arm comprising a downwardly extending compression arm on said pivot arm and inner compressible spring means interposed between said compression arm and said column member, said inner compressible spring means resiliently resisting movement of said compression arm toward said column member to resiliently resist downward pivoting movement of said pivot arm.

4,939,951

IMPACT ABSORBING STRUCTURE FOR USE IN STEERING WHEELS AND THE LIKE

Kazuhiro Kaneko, Shizuoka, Japan, assignor to Nihon Plast Co., Ltd., Fuji, Japan

Filed Jul. 12, 1988, Ser. No. 218,318
Claims priority, application Japan, Jul. 14, 1987, 62-107795
Int. Cl.[5] B62D *1/04*
U.S. Cl. 74—552 8 Claims

1. An energy absorbing support structure comprising:

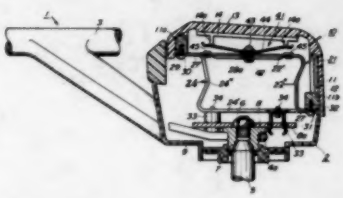
a first laterally extending end member;

a first essentially L-shaped member, said first essentially L-shaped member having first and second leg portions, said first leg portion being straight and one-piece formed with said first laterally extending end member, said second leg portion being sent to facilitate buckling thereof upon the application of a predetermined force;

a second laterally extending end member;

a second essentially L-shaped member, said second essentially L-shaped member having first and second leg portions, said first leg portion of said second essentially L-shaped member being straight and one-piece formed with said second laterally extending end member, said second leg portion of said second essentially L-shaped member being bent to facilitate buckling thereof upon the application of a predetermined force, said second essentially L-shaped member being arranged mutually inverted with respect to the first essentially L-shaped member;

said first essentially L-shaped member being connected at a first end to said first laterally extending member and arranged so that a second end thereof is connected to said second laterally extending member, said second essentially L-shaped member being connected at a first end to said second laterally extending member and connected at a second end to said first laterally extending member, said first essentially L-shaped member and said second essentially L-shaped member being arranged so that said second leg portion of said first essentially L-shaped member is directly connected to said second laterally extending end member; and



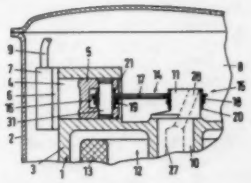
said second leg portion of said second essentially L-shaped member is directly connected to said first laterally extending end member.

4,939,952

CONNECTING ROD FOR AN AXIAL PISTON COMPRESSOR

Bendt W. Romer, and Kurt G. Jorgensen, both of Sonderborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Jan. 9, 1989, Ser. No. 294,360
Claims priority, application Fed. Rep. of Germany, Jan. 22, 1988, 3801802
Int. Cl.[5] F16C *7/08*
U.S. Cl. 74—579 E 8 Claims

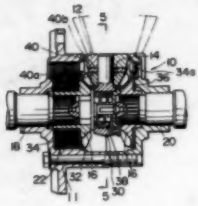


2. A connecting rod for an axial piston compressor, particularly a small hermetically sealed encapsulated refrigerator, comprising a sheet metal member having a longitudinal intermediate portion, a deep drawn cylinder mounting first end portion joined to the intermediate portion and a deep drawn cylinder second end portion joined to the intermediate portion opposite the first end portion and longitudinally offset from the first end portion, a first bushing extending within the first end portion and a second bushing extending within the second end portion, each bushing being made of a bearing material and extending axially in abutting relationship with the respective cylinder mounting end portion, the intermediate portion having a longitudinally extending strengthening bead and the first end portion having a first depression opening to the first bushing and to the bead.

4,939,953
LIMITED SLIP DIFFERENTIAL

Yasuyoshi Yasui, Toyota, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Dec. 8, 1988, Ser. No. 281,328
Claims priority, application Japan, Dec. 8, 1987, 62-186844
Int. Cl.[5] F16H 1/44
U.S. Cl. 475—233 4 Claims



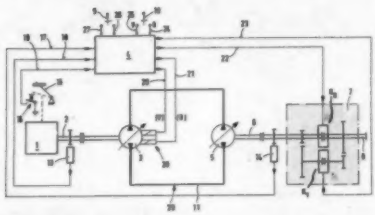
1. A limited slip differential comprising:
a differential case;
a plurality of pinions comprising straight bevel gears and disposed in the differential case, each pinion having a plurality of teeth, each of which includes a first surface and a second surface;
a pair of side gears comprising straight bevel gears meshing with the pinions and disposed in the differential case, each side gear having a plurality of teeth, each of which includes a third surface and a fourth surface; and
frictional force generating means which limits a differential motion produced between shafts coupled respectively with the side gears, the generating means including a plurality of frictional plates,
wherein a pressure angle of the first surface of each pinion tooth is formed larger than a pressure angle of the second surface thereof,
pressure angles of the third and fourth surfaces of each side gear tooth being respectively formed equal to the pressure angles of said first and second surfaces of each pinion tooth,
said pair of side gears being arranged at first and second sides of said pinions such that the first surface of each pinion tooth is contacted with third surfaces of the side gear teeth of the side gear at said first side while the second surface of each pinion tooth is contacted with fourth surfaces of the side gear teeth of the side gear at said second side when said pinions and side gears are rotated in one direction by said differential case, and
said frictional force generating means being arranged such that the number of the frictional plates disposed respectively in a first position between the side gear at said first side and the differential case is different from the number of the frictional plates disposed respectively in a second position between the side gear at said second side and the differential case.

4,939,954
DRIVE SYSTEM FOR MACHINES AND VEHICLES, WITH A HYDRAULIC AND MECHANICAL TRANSMISSION ARRANGED THEREAFTER

Winfried Walzer, Elchingen, and Thomas Sommer, Ulm-Jungingen, both of Fed. Rep. of Germany, assignors to Hydromatik GmbH, Elchingen, Fed. Rep. of Germany

Filed Feb. 15, 1989, Ser. No. 311,533
Claims priority, application Fed. Rep. of Germany, Mar. 8, 1988, 3807599
Int. Cl.[5] F16H 47/06
U.S. Cl. 74—733.1 13 Claims

1. Drive system for machines and vehicles, in particular a traveling drive system for construction vehicles including wheel loaders, excavators and track-laying vehicles, comprising;
a driving motor;
a control member for variably continuously controlling the speed of said driving motor;
a hydraulic converter responsive to a control device, said control device controlling said hydraulic converter according to the speed of the driving motor and on the traveling pressure of the driving motor;
a transmission, in particular a change-under-load transmission, arranged after the hydraulic converter; and

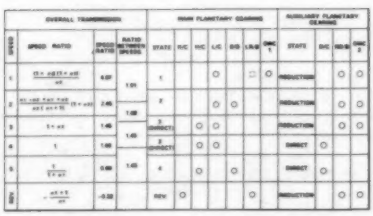


means for shifting the transmission, said means having an electronic control circuit and an operating element for shifting said transmission;
wherein a shifting operation of said transmission from a higher to a lower gear occurs when the output speed of the hydraulic converter before shifting is below a certain predetermined value, and the transmission ratio of the converter before shifting is at a certain predetermined minimum value related to the working pressure of the motor.

4,939,955
PLANETARY GEARING FOR AUTOMATIC TRANSMISSION

Kazuhiko Sugano, Yokohama, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Jul. 28, 1988, Ser. No. 225,189
Claims priority, application Japan, Jul. 28, 1987, 62-186752
Int. Cl.[5] F16H 57/10
U.S. Cl. 475—278 9 Claims



1. A planetary gearing for an automatic transmission, comprising:
a main planetary gearing which has n forward speed states, where n is an integer not less than four, said main planetary gearing including an input shaft and a single output member; and
an auxiliary planetary gearing including an output shaft and a single input member rotatable with said output member of said main planetary gearing, said auxiliary planetary gearing being shiftable between a reduction drive state where a predetermined reduction ratio is established between said input member and said output shaft and a direct drive state where said auxiliary planetary gearing is

locked to rotate as a unit to establish the direct drive between said input member and said output shaft;

wherein, when said main planetary gearing is in any forward speed state among said n forward speed states, said auxiliary planetary gearing is conditioned in said reduction drive state, while said auxiliary planetary gearing shifts from said reduction drive state thereof to said direct drive state thereof after said main planetary gearing has shifted up to said predetermined forward speed state;

wherein said main planetary gearing is shiftable up to an n−1 forward speed state with said auxiliary planetary gearing kept in said reduction drive state thereof, said auxiliary planetary gearing shifts from said reduction drive state thereof to said direct drive state thereof when said main planetary gearing is in said direct drive state thereof when said main planetary gearing shifts up to an n forward speed state thereof.

4,939,956

SYSTEM FOR CONTROLLING SERVO ACTIVATING HYDRAULIC PRESSURE OCCURRING IN VEHICULAR POWER TRAIN

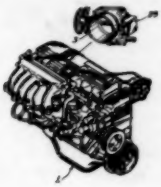
Satoshi Takizawa, Yokosuka City, Japan, assignor to Nissan Motor Company Limited, Yokohama City, Japan

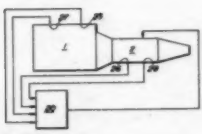
Filed Aug. 9, 1988, Ser. No. 230,383

Claims priority, application Japan, Aug. 10, 1987, 62-121408[U]; Dec. 26, 1987, 62-197729[U]

Int. Cl.[5] B60K *41/06*

U.S. Cl. 74—858 **7 Claims**





1. A system for a vehicular power train including an internal combustion engine with a throttle and an automatic transmission, the internal combustion engine producing an engine output torque variable in a first predetermined pattern against variation of a first predetermined variable, the internal combustion engine changing the pattern of variation of the engine output torque from the first predetermined pattern to a second predetermined pattern in response to a second predetermined variable, the system comprising:

means for detecting the first predetermined variable and generating a first predetermined variable indicative signal indicative of the first predetermined variable detected;

means for detecting the second predetermined variable and generating a second predetermined variable indicative signal indicative of the second predetermined variable detected;

a source of servo activating hydraulic fluid pressure;

a control unit connected to said first predetermined variable detecting means and said second predetermined variable detecting means for receiving said first predetermined variable indicative signal and said second predetermined variable indicative signal;

said control unit includig;

means for determining a first target value in response to said first predetermined variable indicative signal,

means for determining a correction value in respone to said second predetermined value indicative signal, and

means or combining said first target value with said correction value to determine a final target value and generating a control signal indicative of said final target value; and

means for controlling said servo activating hydraulic fluid pressure acting in a shiftinng friction unit in response to said control signal.

4,939,957

LINE PRESSURE CONTROL ARRANGEMENT FOR AUTOMATIC TRANSMISSION

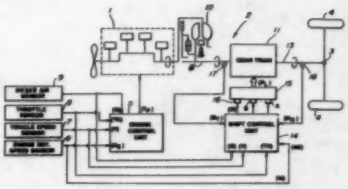
Hiroshi Asano, Zama, and Shigeru Ishii, Atsugi, both of Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed May 5, 1989, Ser. No. 347,636

Claims priority, application Japan, May 6, 1988, 63-109101

Int. Cl.[5] B60K *41/18*

U.S. Cl. 74—866 **4 Claims**



1. In a vehicle;

an engine, said engine having a throttle valve;

a throttle position sensor for sensing the position of said throttle valve and outputting a signal indicative thereof;

an engine speed sensor, said engine speed sensor being arranged to output a signal indicative of the rotational speed of said engine;

an air flow sensor, said air flow sensor being arranged to output a signal indicative of the amount of air being inducted into said engine;

a transmission, said transmission having a line pressure control arrangement comprising circuit means for:

determining the amount of torque being applied to said transmission based on the outputs of said air flow sensor and said engine speed sensor;

determining the level of line pressure appropriate for the instant amount of torque being applied;

comparing the instant throttle opening degree with a predetermined value; and

increasing the level of line pressure for the amount of torque being applied to said transmission in the event that the instant throttle valve opening degree is greater than said predetermined value.

4,939,958

FAIL-SAFE HYDRAULIC CONTROL FOR A FORWARD CLUTCH IN A CONTINUOUSLY VARIABLE TRANSMISSION

Koichi Hayasaki, Fujisawa, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Dec. 28, 1988, Ser. No. 291,262

Claims priority, application Japan, Dec. 28, 1987, 62-329669

Int. Cl.[5] B60K *41/12*

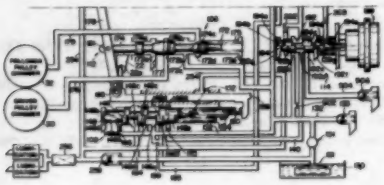
U.S. Cl. 74—867 **5 Claims**

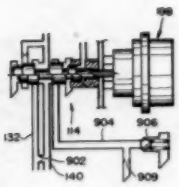
1. In a hydraulic pressure control system for a transmission having a frictional device which is hydraulically activated in response to a hydraulic fluid pressure build-up therein:

a source of regulated hydraulic fluid pressure;

a pressure reduction valve assembly having a first hydraulic

fluid line connectable to the frictional device, a second hydraulic fluid line connected to said source of regulated hydraulid fluid pressure, and a third hydraulic fluid line, said pressure reduction valve assembly including regulating means for regulating fluid supply to said first hydraulic fluid line from said second hydraulic fluid line and fluid discharge from said first hydraulic fluid line to said third hydraulic fluid line thereby controlling a hydraulic fluid pressure build-up in said first hydraulic fluid line;





wherein said regulating means comprises an orifice connecting said first hydraulic fluid line to said second hydraulic fluid line;

means for restraining discharge of hydraulic fluid from said third hydraulic fluid line to keep hydraulic fluid pressure in said third hydraulic fluid line above a predetermined value.

4,939,959

FASTENER HOLDING TOOL

Stephen Rokita, P.O. Box 100, Sussex, N.J. 07461

Filed Oct. 10, 1989, Ser. No. 419,318

Int. Cl.[5] B25B *23/10*

U.S. Cl. 81—44 **15 Claims**

1. A fastener holding tool for removing an installed fastener from a surrounding medium to which the fastener is insufficiently attached to allow normal removal, said tool comprising, in combination:

an elongated tool body having one end portion thereof forming a tool handle;

a pair of spaced jaws attached at the other end of said elongated tool body, said jaws being substantially flat and lying within a plant substantially normal to the longitudinal axis of the tool handle;

a throat portion extending between said jaws for receiving the head of said fastener to be removed and for holding during removal said fastener;

channel means for inserting a removal tool through the handle, said channel means substantially coaxial with said longitudinal axis of said elongated tool body; and,

a heel portion formed by the juncture of the jaws and the tool body and including one or more reinforcement indentations therein, said heel portion, upon the jaws receiving the fastener to be removed, dimensioned to pivot and to cause the fastener to grasp said surrounding medium;

whereby, the fastener holding tool holds the fastener to be removed with a force exerted parallel to the shaft of the fastener, and faciliates removal thereof.

4,939,960

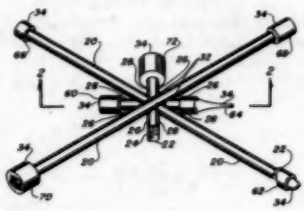
ELECTRICAL ENCLOSURE WRENCH

Lee A. Kinzli, P.O. Box 8714, Newport Beach, Calif. 92658

Filed Aug. 4, 1989, Ser. No. 389,791

Int. Cl.[5] B25B *13/06*

U.S. Cl. 81—124.4 **9 Claims**



1. An electrical enclosure wrench for lid and door fastener attachments comprising:

(a) a pair of crossbar shanks, centrally positioned at right angles to each other forming a cross, having a square tip on each end with an exposed spring loaded ball detent on the tip;

(b) a plurality of socket retaining parking stands having a first and second end, each stand contiguously spaced at the intersection of said shanks, further having a square tip on the first end with a spring loaded ball detent therein;

(c) center joining means rigidly attached to said crossbar shanks at their center and to the second end of said parking stands, said shanks providing an opposed handle for turning and a straight handle for gripping with a remaining end interfacing with a lid or door fastener; and

(d) each square tip having a different tool head socket affixed thereon, held in place by the ball detents, allowing different fasteners on an electrical enclosure lid or door to be rotated in either direction by turning and gripping the crossbar shanks, further the square ends of the shanks and stands allow said sockets to be changed and stored as required to fit a particular application.

4,939,961

REVERSIBLE WRENCH

Clark J. Lee, 429-6 Chung Cheng Rd., Fu Liao Li, Tsao Tun Town, Nantou Hsien, Taiwan

Continuation-in-part of Ser. No. 184,104, Apr. 20, 1988, abandoned. This application Mar. 30, 1989, Ser. No. 330,802

Int. Cl.[5] B25B *13/46*

U.S. Cl. 81—60 **7 Claims**

1. A reversible wrench comprising:

(a) A wrench body including a head and a handle extending therefrom, the head defining a driver housing having an opening perpendicular to the handle at one side;

(b) a first gear face disc having an extended middle portion defining a non-circular hole therethrough and including one side defined by a set of profile teeth and an opposite

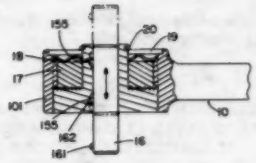
smooth side, the first disc being rotatably received in the housing;

(c) a second gear face disc having a hole through its central portion and a set of profile teeth on one side thereof, the second disc being disposed within the housing in concentric alignment with the first gear face disc, the sets of profile teeth of both disc adapted to be disposed in meshed engagement with each other;

(d) a spring means having a hole through its central portion and disposed with the housing for biasing the first and second discs in meshed engagement with each other;

(e) a cover plate having a hole through its central portion covering the opening of the housing and enclosing the spring means therein;

(f) a driving stud having a non-circular cross-section corresponding to that of the hole through the first disc, the stud being slidably mounted through the holes of the first and



second discs, and the hole of the spring means, the stud having two ends for selective projection through either side of the driver head;

(g) means to non-rotatably connect the second gear face disc to the wrench body head comprising interengaging axial spline teeth formed on the second gear face disc and the wrench body head;

(h) attaching means to attach the cover plate to the extended middle portion of the first gear face disc;

(i) a pair of recesses defined by the extended middle portion, each of the recesses having a generally triangular cross-sectional configuration including an inclined wall and an end wall; and,

(j) a retaining element generally centrally loacted on the driving stud and biased outwardly into contact with the extended middle portion and located so as to enter one of the recesses to limit the sliding of the driving stud relative to the extended middle portion.

4,939,962

METHOD AND APPARATUS FOR INFLUENCING THE MOTION OF A MOVABLE MEMBER

Helmut Wittkopp, Erkelenz; Gerhardt Kluge, Ubach-Palenberg, and Hartwig Klosterhalfen, Dueren all of Fed. Rep. of Germany, assignors to Wilhelm Hegenscheidt Gesellschaft mbH, Erkelenz, Fed. Rep. of Germany

Continuation of Ser. No. 137,175, Dec. 23, 1987, abandoned. This application May 9, 1989, Ser. No. 349,924

Claims priority, application European Pat. Off., Dec. 24, 1986, 86118060

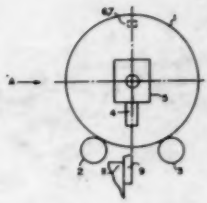
Int. Cl.[5] B23B *3/00*

U.S. Cl. 82—1.11 **8 Claims**

1. A method for controlling the motion of a movable tool (9), in response to varying time durations for the completion of one revolution of a rotatable work piece (1), comprising the following steps:

(a) contacting a circumferential surface of said rotatable work piece (1) with friction drive roller means (2, 3) and friction driving said rotatable work piece (1) by said friction drive roller means (2, 3), wherein the r.p.m. of said work piece changes during a machining operation on a circumferential surface of said work piece by said tool due to slipping between said friction drive roller means and said rotatable work piece, due to changes in the diameter of said friction drive roller means (2, 3), and due to changes in the diameter of said work piece when said machining operation proceeds,

(b) measuring directly at the work piece the time duration required by said rotatable friction driven work piece for completing one revolution, and repeating said time duration measurements during at least part of said machining operation for obtaining signals representing different time durations in accordance with said r.p.m. changes,



(c) converting said measured time duration signals into motion control signals, and

(d) using said motion control signals for controlling the motion of said movable tool during said machining operation, whereby the motion of said movable tool is responsive to said different time durations.

4,939,963

FIXTURE FOR PRECISION TURNING OF A LATERAL SURFACE

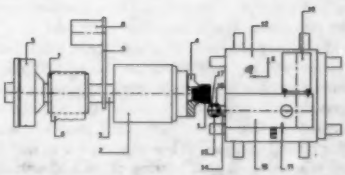
Hans-Jürgen Leiber, Tramelan, Switzerland, assignor to Kummer Freres Sa Fabrique De Machines, Tramelan, Switzerland

Continuation of Ser. No. 176,277, Mar. 31, 1988, abandoned. This application Sep. 7, 1989, Ser. No. 403,988

Claims priority, application Switzerland, Apr. 16, 1987, 1502/87

Int. Cl.[5] B23B *5/00*

U.S. Cl. 82—19 **9 Claims**



1. A device for high precision machining of circular surfaces on a workpiece rotatively driven in a lathe, comprising

a spindle having an axis and means for holding said workpiece secured to said spindle and for driving it in rotation about said axis;

a cross-slide mounted at a front end of said spindle; and

a tool fixture on said cross-slide, said tool fixture comprising:

a slide having a forward end and a rear end, and guiding means for guiding said slide in a direction parallel to said axis,

a tool carrier secured to said forward end,

a secondary shaft borne by said tool fixture and extending perpendicularly to said axis at said rear end, and

a radial cam secured to said secondary shaft, and a reciprocating means for providing a reciprocating movement of said slide in said fixture in response to a rotating movement of said cam,

wherein electrical coupling means are provided for coupling rotation of said secondary shaft and said spindle

when the tool carrier is positioned in a machining position with respect to the workpiece.

4,939,964

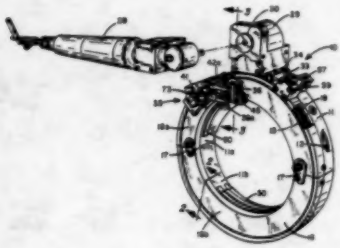
LOW-CLEARANCE PIPE LATHE

Donato L. Ricci, Rte. 1, Box 1067, Hager City, Wis. 54014

Filed Sep. 16, 1988, Ser. No. 245,360

Int. Cl.[5] B23D *21/04*; B23B *5/08*

U.S. Cl. 82—113 **7 Claims**



1. A portable machining lathe for machining a pipe or other work piece, comprising:

(a) a stationary member having a first and second generally semi-circular sections cooperatively connected, said stationary member having a top surface and an outer surface;

(b) locator means for securing said stationary member to the work piece;

(c) a gear member having first and second generally semi-circular sections cooperatively connected;

(d) a plurality of bearings cooperatively connected to said top surface of said stationary member said plurality of bearings forming a single set of bearings defining a circular path;

(e) a circular race member having first and second semi-circular race sections cooperatively connected to said gear member, said race having a groove, said groove having a top and a bottom whereby said race member rotates upon said set of bearings in a circular path; and

(f) said plurality of bearings having at least a first bearing and a second bearing, a first shim positioned between said first bearing and said top surface of said stationary member and a second shim positioned between said second bearing and said top surface of said stationary member, said second shim raising said second bearing relative to said first bearing, wherein said first bearing abuts said bottom of said race groove and said second bearing abuts said top of said race groove.

4,939,965

CUTTING AND THE LIKE TOOLS

Peter Bircumshaw, Sprotborough, England, assignor to W. E. McKenzie Limited, Grimsby, England

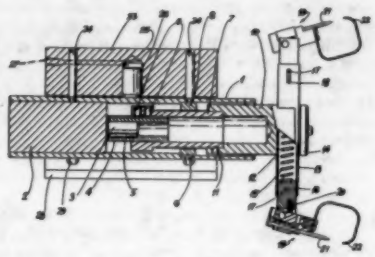
Filed Sep. 13, 1988, Ser. No. 243,807

Claims priority, application United Kingdom, Sep. 18, 1987, 8721974; Nov. 27, 1987, 8727825

Int. Cl.[5] B23B *5/00*

U.S. Cl. 82—113 **8 Claims**

1. A plastics pipe internal joint bead cutting tool comprising a body member, adjustable support means on the body member to locate the body member within the pipe, a motor associated with the body member, a drive shaft extending from the motor, a feed screw means slidably mounted on the shaft, the feed screw means engaging a threaded bore in a drive screw means located in the body member, bead cutter means removably secured to the end of the feed screw means, and said bead cutter means being formed as both a bead cutter and a bead



extraction means enable intact extraction of a cut bead within the pipe along with the cutting tool.

4,939,966

ARRANGEMENT FOR MOUNTING A POWER-OPERATED CLAMPING DEVICE ON A MACHINE-TOOL SPINDLE

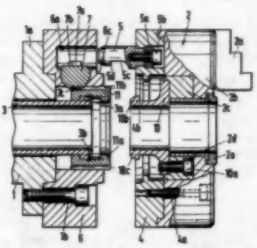
Gerhard Grund, Düsseldorf, and Rainer Kempken, Erkrath-Hochdahl, both of Fed. Rep. of Germany, assignors to Paul Forkardt GmbH & Co., KG, Düsseldorf, Fed. Rep. of Germany

Filed Apr. 26, 1989, Ser. No. 344,303

Claims priority, application Fed. Rep. of Germany, Apr. 26, 1988, 3813982

Int. Cl.[5] B23B *23/02*

U.S. Cl. 82—165 **9 Claims**



1. In an arrangement for mounting a poweroperated camping device for workpieces or tools on a hollow machine-tool spindle in which is disposed a securing rod that is adapted to be coupled with a drive member of the respectively mounted clamping device, and that is adapted to be actuated by a hydraulic or pressurized cylinder secured to a rear end of said machine-tool spindle, with a front end of said spindle being provided with a flange to which is secured an intermediate ring to which a body of said clamping device is adapted to be secured via at least two securing pins, with said clamping device being centered on said intermediate ring via central conical surface means, the improvement wherein:

said securing pins are secured to said clamping device and are axially oriented, with each of said securing pins being provided with notch means that has tightening surface means;

key rods, the number of which corresponds to the number of said securing pins, are displaceably guided in said intermediate ring, with each of said key rods being provided with a key that is introducible into a respective one of said notch means of said securing pins; and

a bayonet ring is rotatably yet axially non-shiftably mounted on a front end of said securing rod, and is adapted to cooperate with a bayonet flange formed on said drive member of said clamping device to effect said coupling of said securing rod to said drive member, with said bayonet ring being provided with an external tooth construction, and with at least one of said key rods being provided with a tooth construction that meshes with said tooth construction of said bayonet ring.

4,939,967

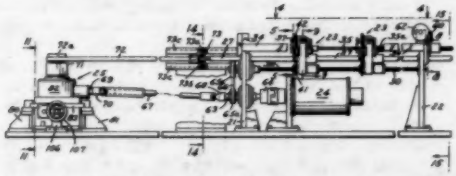
CUT-OFF MACHINE

Bernard J. Wallis, 2215 Dacosta, Dearborn, Mich. 48128

Continuation of Ser. No. 43,035, Apr. 27, 1987, abandoned. This application Jan. 23, 1989, Ser. No. 300,754

Int. Cl.[5] B23D *21/00, 25/04*

U.S. Cl. 83—150 **32 Claims**



1. A cut-off machine adapted to be positioned downstream from a source for receiving moving lengths of tubing such as tubing from the mill and severing a length from the moving length,

said machine comprising a cut-off assembly which is reciprocated longitudinally of the moving length formed by the mill and operated during the movement toward the mill to sever a predetermined length,

means for supporting said cut-off assembly for reciprocating movement,

means for reciprocating said cut-off assembly in synchronism with the speed of moving lengths delivered by the mill to the machine,

said cut-off assembly including a non-rotating knife blade having a cutting edge for movement in an endless path, a portion of said endless path being in a direction transversely to the axis of movement of the moving length of tubing,

means for moving the knife blade for cutting off a length from said moving length of tubing,

supporting means for supporting said tubing adjacent the cut-off assembly, and

means for controlling said endless path such that the knife blade moves in a straight line adjacent each tube supporting means such that said cutting edge of said knife blade moves in a straight line transversely of its cutting edge with respect to said tubing at said support means to cut a length from said moving length of tubing in a single stroke.

4,939,968

GLASS CUTTING APPARATUS

Robert E. Stoof, 3714 41st Ave. S.W., Seattle, Wash. 98116

Filed Aug. 4, 1988, Ser. No. 228,706

Int. Cl.[5] B26D *3/08*

U.S. Cl. 83—886 **27 Claims**

1. A system for scoring a piece of glass along a specified line so that the glass may subsequently be broken along said line to impart a selected contour to the glass, said system comprising:

a. a base with an exposed, horizontal surface;

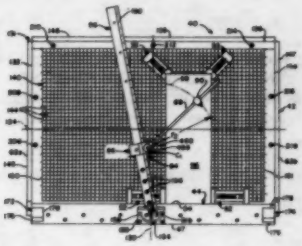
b. stop means for positioning the piece of glass to be scored on said surface of said platform;

c. a pivotable guide which is rotatable about a pivot axis at one edge of and extending normally from said base; and

d. a glass cutter holder displaceable to and fixable at a selected position along said guide;

e. whereby an arc of a selected radius and with said pivot axis as a center can be scored on said piece of glass with a glass cutter mounted in said holder;

f. said guide having an edge along which a glass cutter can



be displaced to score a straight line in said piece of glass; and

g. said system also including means for securing said pivotable glass cutter guide to said base at a selected fixed angle relative to one edge of said base so that said guide can also and alternatively be employed to score said piece of glass along a straight line oriented at said selected fixed angle.

4,939,969

ACOUSTIC KEYBOARD MUSICAL INSTRUMENT

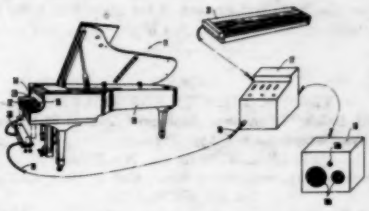
Hanzo Taguchi; Rokurota Mantani; Masatosi Murayama, and Toshihiro Nishino, all of Hamamatsu, Japan, assignors to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 11,498, Feb. 5, 1987, abandoned. This application Nov. 3, 1988, Ser. No. 267,722

Claims priority, application Japan, Feb. 6, 1986, 61-25231

Int. Cl.[5] G10C *3/04; G10H 5/00*

U.S. Cl. 84—719 **5 Claims**



1. An acoustic keyboard musical instrument capable of driving an external electronic musical tone generating means, comprising:

a mechanical musical tone generating mechanism;

a keyboard including a plurality of keys aligned on a musical instrument body to drive said mechanical tone generating mechanism and to produce signals to drive said external electronic tone generating means;

a fallboard pivotally coupled to said musical instrument body and adapted to be closed/opened so as to cover/uncover said keyboard;

musical tone controlling means for controlling tones generated by said external electronic tone generating means and including a manual setting section for allowing a performer to set control information for said external electronic tone generating means;

said manual setting section being located at a position oppo-

site to the performer in an inner surface of said fallboard when said fallboard is open; and

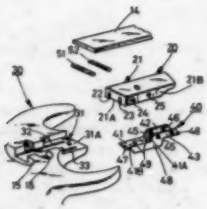
a cable for coupling said musical tone controlling means to said external electronic tone generating means which is spaced apart from said mechanical musical tone generating means, said cable for sending commands generated by said manual setting section to said external electronic tone generating means.

4,939,970

CONNECTOR FOR BODY AND NECK OF STRINGED INSTRUMENTS, LIKE GUITARS

Yoshihiro Hoshino, Nagoya, and Kazuhiro Matsui, Toyoake, both of Japan, assignors to Hoshino Gakki Corporation, Japan

Filed Feb. 3, 1989, Ser. No. 306,510
Claims priority, application Japan, Jun. 15, 1988, 63-79123[U]
Int. Cl.[5] G10D *3/00*
U.S. Cl. 84—293 13 Claims



1. A connector for connecting the body and the neck of a stringed instrument, the combination comprising:

a plate having a neck end portion that is disposed beneath the neck of the instrument, the plate having a body end portion that is disposed above the body of the instrument; and

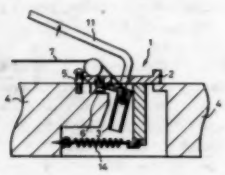
a neck flange extending up from the neck end portion of the plate, said neck flange extending into and connected to the underside of the neck; and a body flange extending down from the body end portion of the plate, said body flange extending into and connected to the top side of the body.

4,939,971

TREMOLO DEVICE FOR A GUITAR

Hiroaki Satoh, Townhouse Soshigaya 203, 6-14-1, Kamisoshigaya, Setagaya-ku, Tokyo, Japan

Filed Sep. 30, 1988, Ser. No. 251,896
Claims priority, application Japan, Oct. 6, 1987, 62-25057
Int. Cl.[5] G10D *3/12*
U.S. Cl. 84—313 18 Claims



1. A tremolo device for a guitar having a guitar head and a guitar body, comprising:

(1) an upper plate mounted on said guitar body to pivot about a first fulcrum, said upper plate being provided with holes through which strings of said guitar pass and having saddles on said upper plate for supporting said strings, said first fulcrum being located at a knife-edge-shaped front end of said upper plate in the direction of said guitar head;

(2) a lower plate, a substantial part of which is below said upper plate and which is pivotably mounted about a second fulcrum located at a knife-edge-shaped front end of said lower plate in the direction of said guitar head, said lower plate fixing one extremity of each of said strings in the vicinity of a rear end of said lower plate opposite to said lower plate front end;

(3) a tremolo arm secured at a rear side of said lower plate to pivot said lower plate about said second fulcrum;

(4) urging means for urging said upper plate in one rotating direction, said lower plate being urged due to the tension of said strings in another rotating direction opposite to said one rotating direction;

(5) a part of said guitar body coming in contact with a rear end of said upper plate on another side opposite to said guitar head to limit a degree of rotation of said upper plate in said one rotating direction, to thereby bring said upper plate to a predetermined position in contact with said part of said guitar body;

said upper plate cooperating with said part of said guitar body so that rotation of said lower plate is limited by contact of said upper plate of said part of said guitar body of said tremolo arm is inactivated, and

said upper and lower plates being rotated together in said another direction when said tremolo arm is activated in such a manner that said lower plate is rotated in said another direction, and

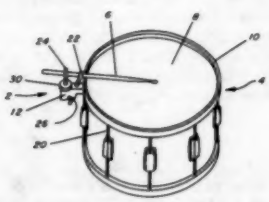
only said lower plate alone is rotated in said one rotating direction when said temolo arm is activated in such a manner that said lower plate is rotated in said one rotating direction.

4,939,972

ADJUSTABLE DRUM CLAMP

William H. Falberg, P.O. Box 1183, Carbondale, Colo. 81623

Filed Nov. 9, 1988, Ser. No. 269,624
Int. Cl.[5] G10D *13/02*
U.S. Cl. 84—422.4 10 Claims



1. An aid for effecting a rim shot on a drum, comprising:

a drum having a rim and a drum head;

a drumstick; and

clamping means connected to said drum for rigidly holding said drumstick against said rim and said drumhead simultaneously such that one end of said drumstick rests on said drumhead and an intermediate portion of said drumstick rests on said rim, whereby striking said drumstick with another drumstick will effect said rim shot.

4,939,973

TONE SIGNAL GENERATION DEVICE HAVING WAVESHAPE CHANGING MEANS

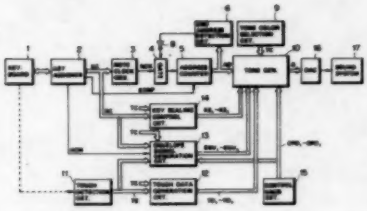
Hideo Suzuki, Hamamatsu, Japan, assignor to Nippon Gakki Seizo Kabushiki Kaisha, Hamamatsu, Japan

Continuation of Ser. No. 6,321, Jan. 14, 1987, abandoned, which is a continuation of Ser. No. 743,476, Jun. 10, 1985, abandoned. This application Sep. 14, 1988, Ser. No. 245,991

Claims priority, application Japan, Jun. 12, 1984, 59-119084; Nov. 4, 1984, 59-231294

Int. Cl.[5] G10H *1/14, 1/16, 7/04*

U.S. Cl. 84—605 **26 Claims**



23. A tone signal generation device comprising:

a waveshape memory storing waveshape data of a tone waveshape defining a first tone color which varies with time and including plural vibratory cycles which are at least portional extracts from a whole vibratory wave of a tone from its start of sounding to the end thereof; and

a non-linear conversion circuit, having an input and output, for converting a waveshape signal applied to said input and derived from a read-out output of said waveshape memory in accordance with a predetermined non-linear function to produce a second waveshape of a second tone color at the output of said conversion circuit said non-linear function including at least a first conversion characteristic for portions of the waveshape signal applied to said input having a first amplitude value and a second conversion characteristic different from the first conversion characteristic for portions of the waveshape signal applied to said input having a second amplitude value.

4,939,974

AUTOMATIC ACCOMPANIMENT APPARATUS

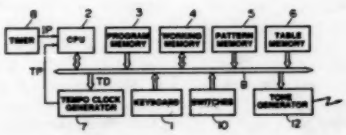
Takashi Ishida, and Yasunao Abe, both of Hamamatsu, Japan, assignors to Yamaha Corporation, Hamamatsu, Japan

Filed Dec. 28, 1988, Ser. No. 291,110

Claims priority, application Japan, Dec. 29, 1987, 62-333219; Dec. 29, 1987, 62-333220; Dec. 29, 1987, 62-333218

Int. Cl.[5] G10H *7/00, 1/36, 1/38, 1/40*

U.S. Cl. 84—609 **5 Claims**



1. An automatic accompaniment apparatus, comprising:

(a) clock generating means for generating a clock signal;

(b) memory means for storing rhythm pattern data designating a presence or absence of tone generation and a musical interval of a chord to be generated at each performance timing based on said clock signal;

(c) chord designating means for designating a chord to be performed;

(d) tone data generating means, including a tone data table having data for plural musical interval modes for each of plural chord types, for reading out said rhythm pattern data based on said clock signal and generating tone data representative of tones which constitute the chord to be generated based on a musical interval mode designated by said rhythm pattern data and the chord designated by said chord designating means; and

(e) musical tone generating means for generating the chord based on said tone data.

4,939,975

ELECTRONIC MUSICAL INSTRUMENT WITH PITCH ALTERATION FUNCTION

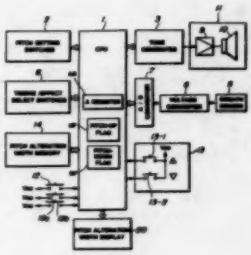
Shigeo Sakashita, Hamura, Japan, assignor to Casio Computer Co., Ltd., Tokyo, Japan

Filed Jan. 24, 1989, Ser. No. 301,247

Claims priority, application Japan, Jan. 30, 1988, 63-11474[U]

Int. Cl.[5] G09B *15/04;* **G10H** *1/053, 7/00*

U.S. Cl. 84—626 **14 Claims**



1. An electronic musical instrument, comprising:

pitch designating means for permitting designation of a pitch designated by a pitch designating operation;

pitch alteration designating means including trill designating means for designating alteration of a pitch designed by said pitch designating means to execute a trill performance;

pitch alteration width programming means for manually programming an alternation width of a pitch to be altered by said pitch alteration designating means;

pitch alteration width memory means for storing pitch alteration width data designated by said pitch alteration width programming means; and

pitch alteration control means for, when pitch alteration is designated by said trill designating means under a condition that a predetermined pitch is designated by said pitch designating means, executing such a control that said pitch designated by said pitch designating means is altered to another corresponding pitch in accordance with said pitch alteration width data stored in said pitch alteration width memory means.

4,939,976

ELECTROMAGNETIC GROUND TO ORBIT PROPULSION METHOD AND OPERATING SYSTEM FOR HIGH MASS PAYLOADS

Michael A. Minovitch, 2832 St. George St. #6, Los Angeles, Calif. 90027

Filed Apr. 1, 1988, Ser. No. 176,679

Int. Cl.[5] F41F *1/02*

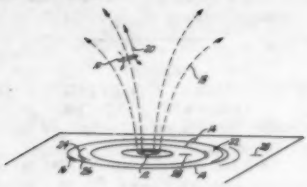
U.S. Cl. 89—8 **18 Claims**

1. A method for accelerating a body to high velocities comprising the steps of:

mounting a plurality of stationary spaced apart superconducting field coils with increasing radii with approxi-

mately concentric and coplanar relative positions on mounting structures;

charging said field coils with electric current thereby creating a primary magnetic field represented by the vector summation of magnetic fields generate by the individual field coils charged with said electric current;



charging a movable superconducting propulsion coil with current so as to create a secondary magnetic field opposing said primary magnetic field;

attaching said body to said superconducting propulsion coil; and

accelerating said body by magnetic repulsive forces exerted on said propulsion coil by said field coils acting simultaneously.

4,939,977

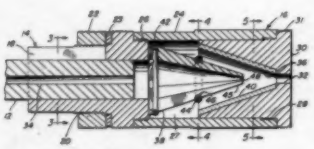
GUN SILENCER AND MUZZLE PROTECTOR

Larry J. Stroup, P.O. Box 743, Oswego, Ill. 60543-0743

Filed Jun. 7, 1989, Ser. No. 362,602

Int. Cl.[5] F41A *21/30*

U.S. Cl. 89—14.4 4 Claims



1. A gun silencer and muzzle protector comprising housing means having a passage therethrough, means attaching said housing means to a gun barrel with said passage being substantially longitudinally aligned with a bore of said gun barrel, and expansion means positioned within said housing means and serving to normally substantially close said passage through said housing means, said expansion means being expandable to permit a bullet exiting from said gun barrel to pass through said passage and then being rapidly closeable to substantially reduce the rate of air return to said bore of said gun barrel subsequent to passage of said bullet to substantially reduce noise generated when firing the gun, said attaching means including an adapter selectively connecting the housing means with said gun barrel, said adapter including legs providing pivotal attachment of said expansion means thereto.

4,939,978

AMMUNITION CHUTING FOR A MACHINE GUN

Frederick J. Bishop, Codsall; David T. Cooper, Fallings Park, and William H. Hill, Willenhall, all of United Kingdom, assignors to Lucas Industries Public Limited Co., West Midlands, England

Filed Mar. 27, 1989, Ser. No. 328,868

Claims priority, application United Kingdom, Mar. 31, 1988, 8807714

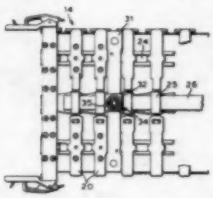
Int. Cl.[5] F41A *9.79*

U.S. Cl. 89—33.14 5 Claims

1. A flexible ammunition chuting for a machine gun, the chuting being capable of flexural bending in all planes perpendicular to a central axis extending along a length of the chuting and of torsional bending about said central axis;

the chuting comprising a plurality of loosely connected relatively slidable and articulated links,

a fixing member being provided at each of two points defined on the chuting, each said fixing member being located between, but unsecured to a plurality of adjacent links of the chuting;



and a non-compressible flexible strip-like spine linked between said two points to the articulated links throughout a portion of the length of the chuting, the spine being non-rigidly attached to each said fixing member, the spine defining a distance between said two points as measured along a path of the spine to prevent change of said distance, while permitting said flexural and torsional bending of the chuting.

4,939,979

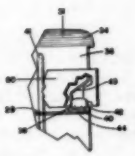
MACHINEGUN AMMUNITION CONTAINER RELATIONSHIP TO OTHER APPLICATIONS

Ross Capawana, 3250 Pollux Ave., Las Vegas, Nev. 89102

Continuation-in-part of Ser. No. 929,339, Nov. 12, 1986, abandoned. This application Feb. 29, 1988, Ser. No. 162,098

Int. Cl.[5] F41C *25/02*

U.S. Cl. 89—34 16 Claims



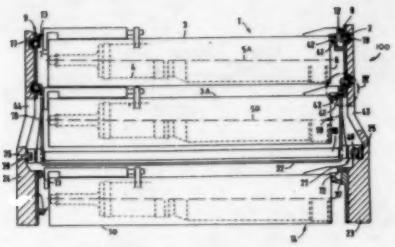
1. A machinegun ammunition container for removably mounting on a bandolier supporter of a M60 machinegun comprises a box having a bottom, enclosed side walls, and an open top, a mounting strap comprising a flat, rigid member spaced from a flat side wall of the container and substantially parallel to said flat side wall, said mounting strap having first and second ends supportively mounted to opposing side walls, a vertical slot defined by the flat side wall and the mounting strap, said vertical slot substantially horizontally spanning the flat side wall, said mounting strap being adapted to fit slideably over the bandolier supporter by extending the bandolier supporter upwardly through the vertical slot, and stabilizing means for reducing undesirable movement of the container when the container is mounted on the bandolier supporter of the machinegun comprising first and second boss means extending inwardly from end portions of the mounting strap adapted to engage first and second notch means on the bandolier supporter when the container is mounted on the bandolier supporter.

4,939,980

TANK TURRET MAGAZINE SYSTEM WITH A PRIMARY MAGAZINE AND AN ADDITIONAL MAGAZINE

Erich Zielinski, Dusseldorf, Fed. Rep. of Germany, assignor to Rheinmetall GmbH, Düsseldorf, Fed. Rep. of Germany

Filed Jul. 25, 1989, Ser. No. 384,687
Claims priority, application Fed. Rep. of Germany, Jul. 26, 1988, 3825292
Int. Cl.[5] F41A 9/34
U.S. Cl. 89—46 11 Claims



1. A tank turret magazine system, comprising:

a primary magazine disposed at a first predetermined height, the primary magazine including elongated ammunition containers having ends and having pivot pins mounted adjacent the ends, the ammunition containers additionally having longitudinal axes, and means for circulating the ammunition containers along an endless path in superposed horizontal planes, the means for circulating including transporting chains, guide means for the transporting chains, and means for releasably connecting the pivot pins of the ammunition containers to the transporting chains so that the longitudinal axes of the ammunition containers are parallel to one another;

an additional magazine which is disposed at a second predetermined height, the second predetermined height being different from the first predetermined height; and

transfer mechanism means for transferring ammunition containers between the magazines, the transfer mechanism means including a pair of transporting levers having means for gripping the pivot pins of the ammunition containers, and means for pivotably mounting the transporting levers,

wherein the means for gripping the pivot pins comprises forks carried by the transporting levers, and wherein the means for releasably connecting the pivot pins to the transporting chains comprises chain link plates carried by the transporting chains and safety latches cooperating with the chain link plates.

4,939,981

HYDRAULIC SERVO CYLINDER DEVICE FOR CONTROLLING CONTINUOUSLY VARIABLE SPEED TRANSMISSION

Kazuya Maki, Aichi; Hideo Koyama, and Takeo Suzuta, both of Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

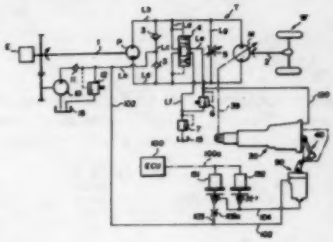
Filed Oct. 19, 1988, Ser. No. 259,784
Claims priority, application Japan, Oct. 22, 1987, 62-267437
Int. Cl.[5] F01B 1/00
U.S. Cl. 91—166 2 Claims

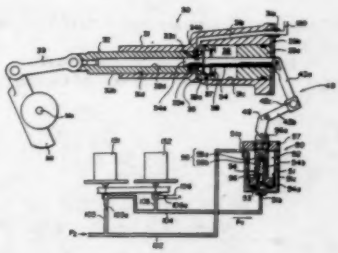
2.A hydraulic servo cylinder for use in a continuously variable tranmission, comrpising

a cylinder chamber defined in said cylinder, said cylinder chamber being divided by a piston into a rod-side cylinder chamber through which a piston rod extends, and a head-side cylinder chamber into which a piston head surface faces, said rod-side cylinder chamber being supplied with a hydraulic line pressure, said head-side cylinder chamber being supplied with a hydraulic control pressure for slidably moving said piston against said line pressure,

a communication passage having one end which opens into said rod-side cylinder chamber when said piston is moved to a position near a head-side stroke end and an opposite end which normally opens into said head-side cylinder chamber, and

a check valve disposed in said communication passage for allowing a flow of hydraulic fluid only from said rod-side





cylinder chamber to said head-side cylinder chamber, the arrangement being such that when said piston is moved to the position neqar the head-side stroke end, the line pressure is supplied from said rod-side cylinder chamber to said head-side cylinder chamber through said communciation passage to control the control pressure in said head-side cylinder chamber so that a hydraulic force which said piston receives from said control pressure in said head side cylinder chamber balances with a hydraulic force which said piston receives from said line pressure in said rod-side cylinder chamber.

4,939,982

AXIALLY CONTRACTABLE ACTUATOR

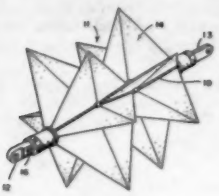
Guy Immega, 4490 West 11th Avenue, Vancouver, British Columbia, Canada V6R 2M3, and Mirko Kukolj, 5490 Braelawn Drive, Burnaby, British Columbia, Canada V6B 4R7

Continuation-in-part of Ser. No. 600,978, Apr. 16, 1984, Pat. No. 4,733,600. This application Oct. 16, 1985, Ser. No. 788,001
Claims priority, application Japan, Jun. 24, 1985, 60-136212
Int. Cl.[5] F15B 15/00
U.S. Cl. 92—92 15 Claims

14. An inflatable axially contractable actuator bladder, comprising:

(a) a plurality of protrusions disposed about said bladder periphery, each such protrusion has a respective base with at least four sides, each base side of a protrusion is substantially straight and attached to a base side of an adjacent protrusion by a first flexible seam or continuous fold, each protrusion is foldable about a second flexible seam or

continuous fold, said second seam or fold being in a plane dividing the protrusion into two parts, from an axially



extended condition in which the protrusion encloses a reduced volume to an axially contracted condition in which the protrusion encloses a larger volume.

4,939,983

FLUID PRESSURE OPERATED POSITIONING APPARATUS

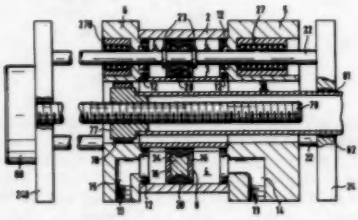
Reinhard Lipinski, Beethovenstr. 75, D-7310 Plochingen, Fed. Rep. of Germany

Filed Jan. 18, 1989, Ser. No. 298,631

Claims priority, application Fed. Rep. of Germany, Feb. 11, 1988, 3804163

Int. Cl.[5] F01B *7/20*

U.S. Cl. 92—62 **14 Claims**



1. Fluid pressure operated positioning apparatus having

an elongated cylinder element (1) closed at both ends;

a piston element (7, 8) slidable in said cylinder element; and

means for applying a pressure fluid to at least one side of the piston element to shift the position of the piston element axially with respect to the cylinder element,

the cylinder element (1) forming a ring cylinder having an outer wall (2) and a hollow inner wall (3) radially spaced from said outer wall, the interior of said inner wall defining a coaxial passageway (30),

said piston element comprising a ring piston having a ring structure (7) surrounding the inner cylinder wall (3), and positioned within the outer wall (2);

end closure means (63, 64) closing off the inner cylinder wall (3);

a linear stroke element (64; 77, 79) movable within said passageway (30) and positionable independently of the ring piston element (8) with respect thereto; and

wherein said linear stroke element comprises a spindle drive (77, 79), including mutually threaded spindle-spindle nut elements, at least one of said elements being coupled to said stroke element.

4,939,984

INVESTMENT-CAST PISTON CROWN CAP WITH ENCAPSULATED NON-METALLIC INSULATING CORE

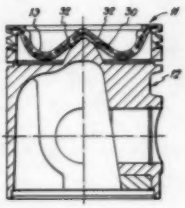
David F. Fletcher-Jones, Holly Grove Cottage, England, assignor to AE PLC, Cawston, United Kingdom

Filed Jun. 1, 1988, Ser. No. 200,961

Claims priority, application United Kingdom, Jun. 18, 1987, 8714287

Int. Cl.[5] F16J *1/01*; F02F *3/26, 3/14*

U.S. Cl. 92—176 **14 Claims**



1. A piston for an internal combustion engine, the piston comprising a crown portion and a body portion, the crown portion having a cap extending over the surface area thereof, said crown cap being an investment casting of an iron-based or a nickel-based alloy, said investment casting also having encasted and encapsulated therein a non-metallic insulating core.

4,939,985

TEST BENCH FOR TESTING THE DRIVE TRAIN OF A VEHICLE

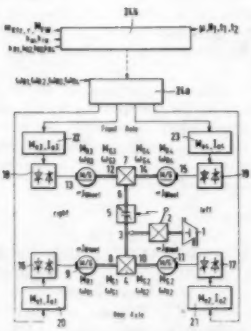
Hans-Jürgen Von Thun, Hemsbach, Fed. Rep. of Germany, assignor to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Apr. 12, 1989, Ser. No. 337,561

Claims priority, application Fed. Rep. of Germany, Apr. 16, 1988, 3812824

Int. Cl.[5] G01M *19/00*

U.S. Cl. 73—118.1 **7 Claims**



1. Test bench for testing a drive train of a test vehicle from an internal combustion engine up to drive shafts for wheels, comprising a electronic function element or computer simulating moments of inertia, spring stiffnesses, and damping masses, said electronic function element or computer simulating the wheels and a vehicle acceleration process, with the exception of actually present vehicle components, at least two mutually independent moment-regulated electric load machines serving as a transmission element between said electronic function element or computer and the test bench having the test vehicle, said load machines being flanged directly to the drive shafts of

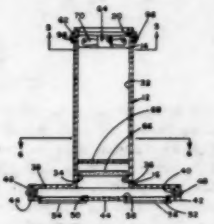
the drive train to be tested, and a integrator having a time constant proportional to the vehicle moment of inertia, said integrator receiving the running resistance moment, reduced by the wheel moments, for picking up the angle speed proportional to the vehicle speed.

4,939,986

EXHAUST VENTILATOR

Charles R. Turner, Decatur, Ala., assignor to John C. Garvin, Jr. & Harold W. Hilton, Huntsville, Ala.

Filed Mar. 6, 1989, Ser. No. 318,850
Int. Cl.[5] F24F 7/007, 13/18
U.S. Cl. 98—42.1 8 Claims



1. A ventilator assembly disposed for secured relation to a partition having an air opening therein, said ventilator assembly comprising:

a housing vertically disposed for passage of air therethrough, said housing having an elongated body portion provided with first and second end sections, said elongated body portion disposed for extending into said opening in said partition;

a first cap member removably secured to said first end section, said cap member having an opening for communication with the interior of said housing;

a second cap member removably secured in said second end section, said second cap member having air inlet means therein, said air inlet means disposed in communication with the interior of said housing;

an electric motor having blades secured thereto, and said motor mounted adjacent said first section of said housing and a source of electric energy connected to said electric motor for actuation thereof for rotation of said blades to exhaust air through said housing;

baffle means including a flexible member movably carried in unsecured relation to said housing intermediate said electric motor and said air inlet means;

support means for supporting said baffle member in said housing, said support means including an inwardly extending flange portion forming a central opening for passage of air therethrough, said baffle member disposed in loosely seated relation on said flange portion over said central opening and disposed for upward displacement from a closed seated position over said opening to an open position away from said opening responsive to entrainment of air past said baffle member as a result of blade rotation by said motor; and

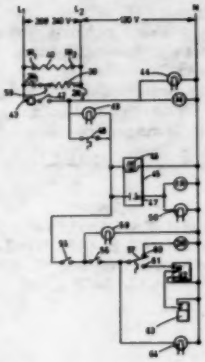
restraining means disposed in spaced relation above said baffle member to limit said displacement thereof and to provide for said loosely seated relation of said baffle member on said flange portion.

4,939,987

HUMIDITY CONTROL SYSTEM

Mark J. Smith, Fuquay-Varina, N.C., assignor to Anetsberger Brothers, Inc., Northbrook, Ill.

Filed Aug. 14, 1989, Ser. No. 393,967
Int. Cl.[5] F24H 9/00; H05B 1/00, 3/10; A21C 13/00
U.S. Cl. 99—468 7 Claims



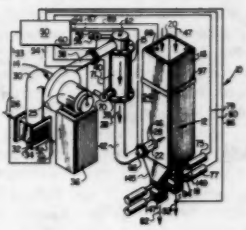
1. Apparatus for controlling the humidity of an enclosed atmosphere comprising: an open top steamer tray, a heater in intimate heat transfer relation with said tray, a time regulated valve operable to supply water to said tray for selected time periods, thermal responsive means operably responsive to the temperature of said tray for activating and deactivating said heater when said tray reaches selected low and high temperatures, respectively, and for actuating said valve to supply water to said tray when said heater is deactivated at said high temperature, and humidity responsive means for controlling activation of said thermal responsive means.

4,939,988

ANTI-CORING GRAIN TREATMENT SYSTEM

W. Gerald Wyatt, Arlington, Tex., and Jim Bleke, Wolcottville, Ind., assignors to VE Holding Corp., Arlington, Tex.

Continuation of Ser. No. 766,640, Aug. 16, 1985, Pat. No. 4,817,518. This application Oct. 25, 1988, Ser. No. 262,430
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] A23K 1/00
U.S. Cl. 99—516 13 Claims



1. An improved grain treatment system for selectively conditioning substantially homogeneous plugs of grain with a conditioning medium comprising:

a substantially vertically disposed vessel having an upper and lower end, said vessel having an inlet in said upper

end and an outlet in said lower end such that said grain can be passed therethrough;

means for controlling the flow of grain within said vessel, said flow control means causing said grain to flow within said vessel in substantially homogeneous plugs; and

means for injecting said conditioning medium into said vessel for contact with said substantially homogeneous plugs of grain to produce substantially homogeneous plugs of conditioned grain;

said flow control means including first and second flow valves and means for sequentially opening and closing said first and second flow valves;

wherein the sequential opening and closing of said first and second flow valves cause said grain in said vessel to flow in substantially homogeneous plugs.

4,939,989

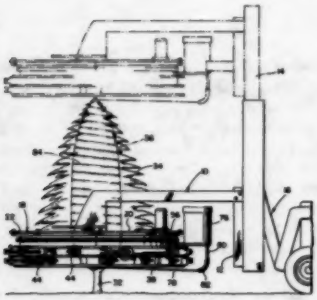
TREE LIMB FOLDING AND TYING APPARATUS

Donald Zacharias, R.D. #2, Box 151, Weatherly, Pa. 18255

Filed Mar. 2, 1989, Ser. No. 318,112

Int. Cl.[5] B65B *13/10*

U.S. Cl. 100—13 **13 Claims**



1. A tree limb folding apparatus including base means for support from an elevatable support, a generally annular horizontal frame mounted from said support for elevational shifting therewith and defining a central area therewithin in which to receive a lower trunk portion of a tree, said frame including at least two peripherally adjacent arcuate frame sections shiftable relative to each other and said support for movement between closed positions closing said annular frame and open positions with adjacent ends of said adjacent arcuate frame sections displaced apart and defining a passageway between said adjacent ends through which to receive the lower trunk portion of a tree into said central area of said annular frame upon horizontal advancement of said open frame toward said tree, said peripherally adjacent frame sections each including upper and lower sets of horizontal rollers, for engaging and folding tree limbs, supported from the corresponding frame section for guided shifting generally radially of the corresponding frame section between inward limit positions disposed about and defining said central area when said shiftable frame sections are in the closed positions thereof and outward limit positions spaced outward of said inward limit positions, each of said rollers being disposed generally normal to the path of guided shifting thereof relative to the corresponding frame section, biasing means yieldingly biasing said rollers toward their inward limit positions, the upper and lower rollers of each arcuate frame section being alternately spaced thereabout with adjacent ends of peripherally adjacent rollers of each frame section being end overlapped when said peripherally adjacent rollers are in said inward limit positions thereof.

4,939,990

MULTI-SURFACED ROTARY STAMPING APPARATUS

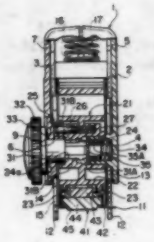
Shoichi Inaguma; Masayuki Hasegawa, and Akira Ichihashi, all of Nagoya, Japan, assignors to Shachihata Industrial Co., Ltd., Japan

Filed May 26, 1989, Ser. No. 357,765

Claims priority, application Japan, May 31, 1988, 63-72661[U]; Aug. 2, 1988, 63-102645[U]

Int. Cl.[5] B41J *1/36*

U.S. Cl. 101—109 **8 Claims**



1. A rotary stamping apparatus comprising:

a plurality of stamp cartridges, each of said stamp cartridges having a use position and at least one non-use position;

rotatable shaft means for holding said plurality of stamp cartridges faced outwardly, said shaft means having a plurality of edge faces and a polygonal transverse cross-section, and each of said stamp cartridges being slidably mounted on one of said edge faces;

a gripper case having a plurality of recesses formed therein;

elevator frame means for supporting said shaft means at its opposite sides, said elevator frame means having an inverted U-shaped configuration in cross-section and an outer end, and said elevator frame means further being slidably mounted within said gripper case and movable between an outer position in which said outer end is positioned outwardly from a plane including one of said stamp cartridges in its use position and in inner position in which said elevator frame means is retracted inwardly from said plane;

first biasing means for biasing said elevator frame means toward said outer position; and

selector knob means for rotating said shaft means to the desired position, said selector knob mean shaving a back face and a stopper formed in said back face;

said stopper and said recesses defining engagement means for holding said shaft means in place, said stopper being movable in and out of engagement with said recesses, said engagement means being movable between an operative position when said stopper is in engagement with one of said recesses and in inoperative position when said stopper is out of engagement with one of said recesses; and

second biasing means for normally biasing said selector knob means outwardly away from said gripper case, said selector knob means being movable against said second biasing means to move said engagement means into said operative position.

4,939,991

MULTICOLOR SCREEN PRINTING ASSEMBLY

Sandor Szarka, Franklin Lakes, N.J., assignor to Precision Screen Machines, Inc., Hawthorne, N.J.

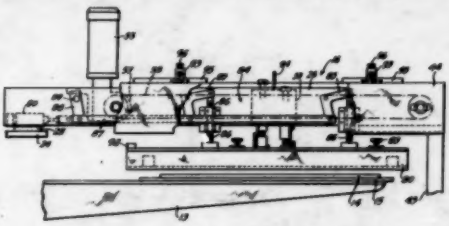
Continuation of Ser. No. 118,429, Nov. 6, 1987, abandoned. This application Feb. 2, 1989, Ser. No. 304,936

Int. Cl.[5] B41F *15/04*

U.S. Cl. 101—115 **8 Claims**

1. A screen printing machine comprising in combination a central base structure supporting thereupon a rotatable col-

umn, a plurality of circumferentially spaced radial arms projecting from said column and supporting each a corresponding pallet at the same radial distance from said column and in a common plane for receiving a fabric article to be screen printed, a plurality of printing head frame assemblies disposed in another common plane parallel to and spaced from said pallet common plane, said printing head frame assemblies being located about a circle spaced from one another and positioned radially from said column so that, for each of a plurality of indexable locations of said rotatable column, each printing head frame assembly will be aligned in juxtaposition



with a different pallet, and machine frame members interconnecting one end of each said printing head frame assembly with said rotatable column and connecting the opposite end of each said printing head frame assembly with said base structure whereby said printing head frame assemblies are integrated into a boxlike rigid skeletal machine frame, and means supported by each said printing head frame assembly for transferring a screen into a position proximate to a pallet-supporting article in a manner to permit screen printing onto said article, wherein each said printing head frame assembly and said means supported thereby comprise a single integrated unit located entirely on one side of said pallet common plane.

4,939,992

FLEXOGRAPHIC COATING AND/OR PRINTING METHOD AND APPARATUS INCLUDING INTERSTATION DRIERS

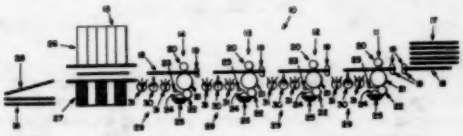
John W. Bird, Westport, Conn., assignor to Birow, Inc., Westport, Conn.

Continuation-in-part of Ser. No. 65,914, Jun. 24, 1987, Pat. No. 4,841,903. This application Apr. 11, 1989, Ser. No. 336,219

The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.

Int. Cl.[5] B41F *5/24*

U.S. Cl. 101—183 **11 Claims**



1. In a flexographic, straight line printing machine comprising a plurality of liquid application stations each comprising a printing cylinder, at least one of which is an upstream ink printing station for the printing of ink images containing a volatile solvent/diluent onto a succession of individual cardboard copy sheets as such sheets are moved therethrough, and at least one of which is a downstream printing station , and means for continuously feeding said individual copy sheets, without bending, through said liquid application stations, the improvement which comprises an intermediate drying station comprising at least one forced hot air means positioned between each of said liquid application stations to apply a line of forced hot air across the direction of travel of said sheets as they move therepast to effect the evaporation of the solvent-/diluent from the ink images printed on said cardboard copy sheets prior to the movement of the ink-imaged copy sheets into the next liquid application station, to effect the drying of said images prior to the application of the rink images or a coating therecver.

4,939,993

DETONATOR

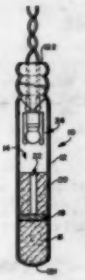
Jean L. Curutchet; Michael P. du Plessis, and André P. Crane, all of Johannesburg, South Africa, assignors to AECI Limited, Johannesburg, South Africa

Filed Apr. 28, 1989, Ser. No. 344,803

Claims priority, application South Africa, Apr. 29, 1988, 88/3082

Int. Cl.[5] F42C *19/12*

U.S. Cl. 102—202.14 **3 Claims**



1. A detonator which includes

an elongate tubular member which defines a longitudinally extending passage;

said member having a closed first end and an open second end with an initiating means being received in the open end for initiating a primary charge;

a first base charge located at the closed end of the passage and a second base charge arranged intermediate the initiating means and the first base charge and

the primary charge which is shaped and dimensioned and which is located in the passage in a position relative to the base charges such that, upon initiation of the primary charge, a shock front generated by the primary charge is propagated by the base charges in a bi-directional manner, the primary charge being located between said base charges, said second base charge having an axially extending open bore in communication with said primary charge and said initiating means, the primary charge and the initiating means being positioned at opposite ends of said bore thereby permitting a flame front generated by the initiating means to pass to the primary charge to thereby initiate the primary charge and generate the shock front which is propagated by the base charges in said bi-directional manner.

4,939,994

ENGRAVED PRINTING ROLLS

Sidney Pulestou, Bridlington, England, assignor to Borden, Inc., Columbus, Ohio

Filed Sep. 26, 1988, Ser. No. 248,411

Claims priority, application United Kingdom, Jan. 23, 1988, 8801537

Int. Cl.[5] B41F *31/26, 27/28*

U.S. Cl. 101—348 **8 Claims**

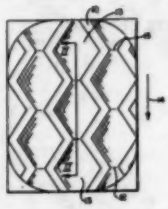
1. A mechanically engraved cylindrical printing roll having cells interconnected at weirs in a line defining a circumference of the roll, to form a plurality of circumferentially extending chains around the roll,

the walls defining each cell form an elongated rhombus

outline with a major axis and a minor axis, said major axis having a length greater than the length of the minor axis, said major axis extending in the direction of said circumference of the roll,

the corners of each circumferentially adjacent rhombus at both ends of the major axis overlapping to the extent that no rhombus includes an outline of a sharp point along said major axis, said circumference being coextensive with the major axis of each rhombus in said circumference,

said weirs defining a sharp dividing line between cells, said



weirs comprising the highest elevation on said circumference, said circumferential line substantially bisecting each weir,

the depth of each of said cells increasing in both directions from the said weirs,

each chain being spaced from adjacent chains by a zig-zag shaped wall of uniform elevation and width,

each said wall extending circumferentially around the roll such that no wall contacts any other wall, and

each wall is configured to be a mirror image of any next adjacent wall.

4,939,995

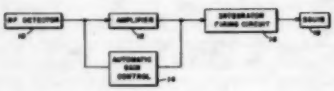
INTEGRATOR AND FIRING CIRCUIT FOR PROXIMITY FUZES

Arthur R. Feinberg, Brookeville, Md., assignor to The United States of America as represented by the Secretary of the Navy, D.C.

Filed Nov. 11, 1974, Ser. No. 523,785

Int. Cl.[5] F42C *13/04*

U.S. Cl. 102—214 **4 Claims**



1. An integrator firing circuit for use with a fuze for firing a grounded squib of an explosive weapon comprising:

a transistor biased to transform a negatively biased varying electrical signal to a fullwave rectified negatively biased signal at its collector lead;

means for integrating said fullwave rectified signal;

first switching means connected to said means for integrating for producing a first pulse upon detection of a signal from said means for integrating which exceeds a predetermined threshold level and,

capacitive discharge means connected to said first switching means for producing a second pulse to ignite said grounded squib of said explosive weapon.

4,939,996

CERAMIC MUNITIONS PROJECTILE

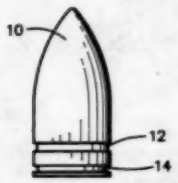
Brian I. Dinkha, Westminster; Paul B. Jass, Denver; Brian Seegmiller, Arvada, and Alden C. Simmons, Boulder, all of Colo., assignors to Coors Porcelain Company, Golden, Colo.

Continuation-in-part of Ser. No. 903,307, Sep. 3, 1986, Pat. No. 4,850,278. This application Aug. 31, 1988, Ser. No. 239,131

The portion of the term of this patent subsequent to Jul. 25, 2006, has been disclaimed.

Int. Cl.[5] F42B *8/00*

U.S. Cl. 102—501 **14 Claims**



1. A tough, densified munitions projectile comprising a ceramic having a tensile strength greater than about 250 MPa, a critical stress intensity factor greater than about 6 MPam$^{\frac{1}{2}}$, and a Weibull modulus greater than about 10, said ceramic comprising material selected from the group consisting of zirconia, zirconia-toughened alumina, and SiC whisker-reinforced alumina.

4,939,997

ARTICLE OF AMMUNITION

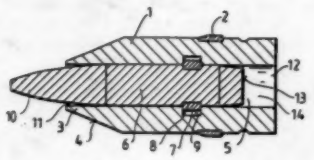
Dietrich Hoffman, Schramberg, Fed. Rep. of Germany, assignor to Mauser-Werke Oberndorf GmbH, Oberndorf, Fed. Rep. of Germany

Filed Sep. 7, 1989, Ser. No. 404,117

Claims priority, application Fed. Rep. of Germany, Sep. 29, 1988, 3833001

Int. Cl.[5] F42B *10/34*

U.S. Cl. 102—503 **2 Claims**



1. Article of ammunition, especially for utilization with cannon mounted on board aircraft; comprising a subcaliber projectile core; a tubular projectile possessing a substantially constant internal diameter coaxially arranged on said projectile core to form an inherently stable secondary projectile for the assuming of an estimatable trajectory, a head end of the projectile core protruding beyond a forward end of said secondary projectile, said tubular projectile having an open tail end projecting beyond the trailing end of said projectile core to provide a rearwardly opening chamber for the receipt of gases generated by a propellent charge and to exert a propulsive force against said projectile core and said tubular projectile in the direction of firing thereof, the forward end of the tubular projectile being tapered down by a taper surface to form a conical leading end portion an open space intermediate the forward end of the tubular projectile and the head end of the projectile core; and spring ring securing means responsive to centrifugal force being arranged in aligned circumferential grooves intermediate said tubular projectile and said projectile core, said spring ring securing means forming a seal intermedi-

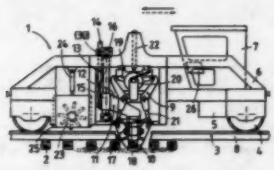
ate said tubular projectile and said projectile core to inhibit the passage of gases therebetween, and upon firing of said projectile, being radially outwardly expandable within said grooves responsive a spin of said projectile so as to release the engagement between said projectile core and said tubular projectile.

4,939,998

BALLAST TAMPING MACHINE

Josef Theurer, Vienna, Austria, assignor to Fran Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H., Vienna, Austria

Filed Mar. 8, 1988, Ser. No. 165,510
Claims priority, application Austria, Jul. 23, 1987, 18774
Int. Cl.[5] B61D *15/00*
U.S. Cl. 104—12 **6 Claims**



1. In a mobile machine for tamping ballast under ties of a railroad track, each of the ties having opposite longitudinal sides extending transversely to the track, which comprises a machine frame, spaced undercarriages supporting the machine frame for mobility on the railroad track in an operating direction, and a ballast tamping assembly mounted on the machine frame and comprising a vertically adjustable tamping tool carrier, a drive for vertically adjusting the tamping tool carrier, pairs of vibratory and reciprocatory tamping tools immersible in the ballast upon vertical adjustment of the tamping tool carrier, and drives for vibrating and reciprocating the tamping tools in a direction extending parallel to the track for tamping ballast under respective ones of the ties positioned between the pairs of tamping tools;

(a) a vertically adjustable device associates with the ballast tamping assembly for gripping and transversely displacing and positioning a respective one of the ties, the device comprising

(1) pivotally adjustable clamps for gripping the longitudinal tie sides and

(2) drive means for adjusting the clamps,

(b) drives for vertically and transversely adjusting the device, the adjusting drives connecting the device to the machine frame,

(c) a vertically adjustable ballast broom device preceding the ballast tamping assembly in the operating direction and arranged for sweeping ballast off respecitve ones of the ties into an adjacent crib defined between successive ones of the ties, and

(d) a drive for vertically adjusting the broom device.

4,939,999

INTEGRATED CONVEYOR SYSTEM WITH CONSTANT SPEED DRIVE CHAIN

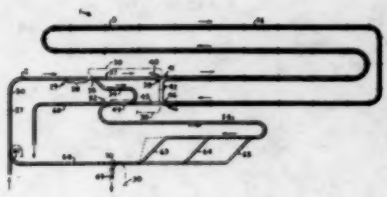
Harold S. Burt, Kansas City, and Benjamin P. Difalco, Overland Park, both of Kans., assignors to Mid-West Conveyor Co., Inc., Kansas City, Kans.

Filed Aug. 30, 1999, Ser. No. 238,831
Int. Cl.[5] B61J *3/00*; B61B *13/00*; B65G *37/00*
U.S. Cl. 104—88 **24 Claims**

1. A conveyor system comprising:

(a) a first section comprising a power and free conveyor including power and free trolleys transporting product carriers on a first power and free track driven selectively by a first power and free chain;

(b) a second section connected with said first section; said second section including a second track operably supporting a continuous second drive chain that during normal operation of said system generally continuously moves at a constant speed and a third track positioned beneath said second track operably supporting said power and free trolleys while within said second section such that said power and free trolleys are driven about said second



section by said second drive chain; said second drive chain also continuously carrying at least one utility carrier depending therefrom;

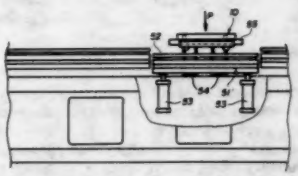
(c) so that said trolleys are conveyable along said first section and transferable to said second section such that said transfered trolleys and associated product carriers are interspaced with said utility carrier.

4,940,000

MODULAR INSTALLATION FOR CONTROLLED TRANSPORT OF PARTS OR PRODUCTS

Laszlo Horvath, Geneva, Switzerland; Georges Martin, Collonges S/Saleve, France, and Heiner Schween, Gummersbach, Fed. Rep. of Germany, assignors to Sysmo S.A., Switzerland

PCT No. PCT/CH86/00098, § 371 Date Apr. 16, 1987, § 102(e) Date Apr. 16, 1987, PCT Pub. No. WO87/00493, PCT Pub. Date Jan. 29, 1987
PCT Filed Jul. 16, 1986, Ser. No. 44,847
Claims priority, application France, Jul. 17, 1985, 85 11048
Int. Cl.[5] B60L *15/38*
U.S. Cl. 104—295 **16 Claims**



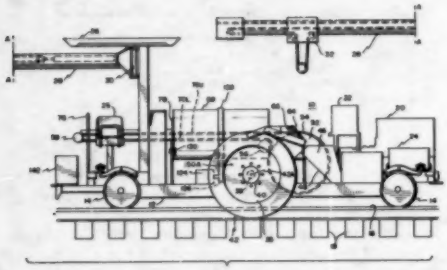
1. A modular apparatus for the controlled transport of work pieces in a production, assembly or processing line, comprising

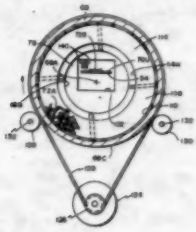
(a) a modular network of interconnected track sections comprising first and second parallel rails, at least one of which is electrically powered, and first and second parallel rail support means, said first and second rails being respectively affixed to said first and second rail support means and said network of track sections comprising one or more work station track sections having a platform situated between said rails wherein said rail support means within said work station track section are capable of moving said track section rails to a position lower than said platform;

(b) at least one self-propelled electrically powered wheeled vehicle adapted to ride upon said track section rails, said vehicle having a plate, mounted above said wheels, including a central support zone for engagement on the underside by said platform; and

(c) a central data processing means capable of remotely controlling said vehicles.

4,940,001
RAIL SPIKE CLEANING APPARATUS
John D. Holley, Montgomery, Ala., assignor to Holley Engineering Company, Inc., Montgomery, Ala.
Filed Nov. 9, 1988, Ser. No. 269,074
Int. Cl.[5] E01B *29/32*
U.S. Cl. 104—307 38 Claims



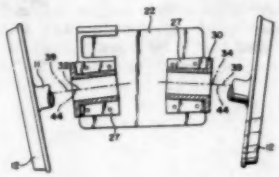


1. A spike cleaning apparatus comprising:
(a) a tumbler having a cleaning chamber therein;
(b) a motor means operatively connected to move said tumbler and for cleaning spikes by tumbling action of spikes within said cleaning chamber; and
(c) a vehicle frame having rail engaging wheels mounted thereto and operable to move along a railroad track, said tumbler mounted to said vehicle frame; and
further comprising input means to automatically pick up spikes and feed spikes continuously into said tumbler while it is tumbling and means to automatically discharge cleaned spikes from said tumbler while said tumbler is tumbling.

4,940,002
RAILWAY TRACTION MOTOR WITH SKEWED SUPPORT BEARINGS
Paul R. Bien, Downers Grove, Ill., assignor to General Motors Corporation, Detroit, Mich.
Filed Dec. 7, 1988, Ser. No. 280,799
Int. Cl.[5] B61C *17/00*
U.S. Cl. 105—136 8 Claims

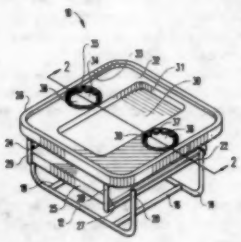
1. A traction motor for a railway power vehicle of the type having a body, a rail engagable wheel and axle assembly including a pair of laterally spaced driving wheels fixed to an axle with motor support journals on the axle inwardly adjacent the wheels, said body being supported on at least one wheel and axle assembly by suspension means engaging the axle at support points outboard of the wheels, whereby the weight of the body causes slight concave downward bending of the axle between the wheels with resulting outwardly downward sloping of the support journals and respective axes thereof,

said traction motor having a frame with a pair of bearing supports disposed at spaced locations near opposite ends of the motor frame and each including an axle support bearing having a transverse bore centered on an axis, said bearing bores being engagable with the motor support journals of the axle at spaced locations between and relatively near the wheels to at least partially support the motor on the axle, and the improvement wherein



the axis of at least one of the bearing bores is sloped downwardly toward its respective end of the traction motor by a small amount sufficient to more closely align the axis of the said one bearing bore with the downwardly sloping axis of the associated motor support journal at the location of their engagement and thus improve the conformity of the engagable bearing bore and motor support journal surfaces.

4,940,003
CAR SEAT TABLE
Susan L. Mayhew, and Richard K. Mayhew, II, both of 4311 Landeros Ave., La Verne, Calif. 91750
Filed Jun. 23, 1989, Ser. No. 370,183
Int. Cl.[5] A47B *23/00*
U.S. Cl. 108—44 1 Claim



1. A car seat table, comprising:
an upper tray;
a central recessed area formed on said upper tray;
an upstanding peripheral rim on said upper tray, surrounding said central recessed area;
at least one circular opening formed through said upper tray for receiving a beverage container;
a removable insert having a reduced diameter opening dimensioned to be retained in said circular opening for use with different diameter beverage containers;
a plurality of resilient radially inwardly extending fingers spaced around said insert for engagement with various different diameter beverage containers;
an annular rim surrounding said circular opening in said tray for supporting said insert;
a lower tray;
an upper frame securing said upper and lower trays in parallel spaced relation, said frame formed by a plurality of rigid tubular members;
a parallelogram linkage mounting said first and second trays

for simultaneous movement in fixed relation between vertically raised lowered positions;

said parallelogram linkage formed by four corner frame members each having a lower end pivotally mounted to corner portions of a fixed lower frame and an upper end pivotally mounted adjacent corner portions of said lower tray;

two of said corner frame member dimensioned to receive a vehicle lap type seat belt in surrounding relation when in a vertical position; and

said upper frame dimensioned for abutment with a vehicle seat back when in said raised position, whereby tightening of the vehicle seat belt will initially move said upper and lower trays to said raised position and will subsequently maintain said upper and lower trays in said raised position.

4,940,004

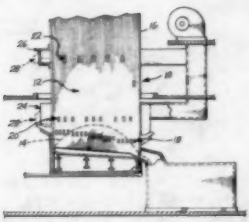
HIGH ENERGY COMBUSTION AIR NOZZLE AND METHOD FOR IMPROVING COMBUSTION IN CHEMICAL RECOVERY BOILERS

Johan H. Jansen, Bellevue, Wash., assignor to J. H. Jansen Company, Inc., Woodinville, Wash.

Filed Jul. 7, 1989, Ser. No. 376,824

Int. Cl.[5] F23L *5/00*

U.S. Cl. 110—182.5 **10 Claims**



1. For use in connection with a recovery boiler having a combustion chamber and at least one wind box positioned in surrounding relationship relative to said combustion chamber, an apparatus for improving the delivery of airflow from said wind box into said combustion chamber, said apparatus comprising:

a nozzle extending through said wind box and having a convergent portion; and

a damper section positioned outside of said wind box, said damper section defining an airflow path from inside said wind box into said nozzle, wherein said nozzle interconnects said damper section and a port leading into said combustion chamber, said convergent portion of said nozzle accelerating the airflow delivered into said chamber.

4,940,005

DEVICE FOR INJECTING PREHEATED AIR INTO A SHAFT FURNACE

Marc Solvi, Ehlange/Mess, Luxembourg, assignor to Paul Wurth S.A., Luxembourg, Luxembourg

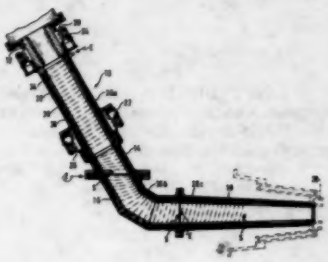
Filed May 25, 1989, Ser. No. 357,552

Claims priority, application Luxembourg, May 25, 1988, 87226

Int. Cl.[5] F23L *5/00, 1/00*

U.S. Cl. 110—182.5 **5 Claims**

1. A device for injecting preheated air from an air supply into a shaft furnace, having a central conduit means for directing a stream of preheated air in a flow direction, said central conduit means being defined by a refractory lined downpipe, elbow and tuyere, wherein the improvement comprises a cooling coil means embedded in the refractory lining for circulating cooling air through the refractory lining in the flow direction, said cooling coil having an outlet for discharging the cooling air into the central conduit means.



4,940,006

PROCESS FOR INCINERATION OF REFUSE

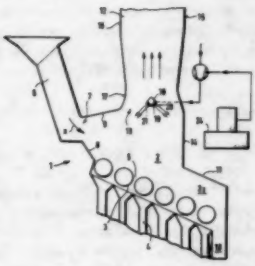
Sedat Temelli, Erkrath, Fed. Rep. of Germany, assignor to Mullverbrennungsanlage Wuppertal GmbH, Fed. Rep. of Germany

Filed Mar. 23, 1988, Ser. No. 172,085

Claims priority, application Fed. Rep. of Germany, Apr. 9, 1987, 3712039; May 14, 1987, 3716088

Int. Cl.[5] F23G *5/00*

U.S. Cl. 110—243 **12 Claims**



1. Process for incineration of refuse or the like, where the substances to be burned enter a furnace space and are burned on a grate in the furnace space, and the flue gases formed by combustion are exhausted from the furnace space through a throttled portion and turbulence is created in the gases by adding secondary air for the purpose of afterburning of the flue gases in an afterburning zone, comprising the steps of

damming the flue gases before entering the afterburning zone so as to increase the retention time of the flue gases in the furnace space in a uniform temperature zone of the furnace space, and then accelerating the flow of flue gases in a venturi-like manner in the afterburning zone, and then decelerating the flow of flue gases in a venturi-like manner in the afterburning zone; and

injecting the secondary air below the throttle portion across the entire cross section of flow of the flue gases in front of the point of entrance of the flue gases into the afterburning zone in a direction opposite to the flow of the flue gases toward the afterburning zone, so that the flue gases are additionally decelerated in said uniform temperature zone of the furnace space so as to further increase the residence time of the flue gases in the furnace space, and so that the combustible constituents entrained in the flue gases are

burnt out completely before entering the after burning zone;

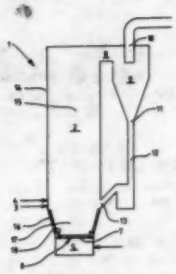
so as to reduce the unwanted gaseous components in the flue gases.

4,940,007

FAST FLUIDIZED BED REACTOR

Matti Hiltunen, Karhula, Finland; Ragnar Lundqvist, Norwood, Colo., and Juha Sarkki, Karuna, Finland, assignors to A. Ahlstrom Corporation, Noormarkku, Finland

Filed Aug. 16, 1988, Ser. No. 232,778
Int. Cl.[5] F27B *15/02*; B01J *8/18*, *15/06*
U.S. Cl. 110—347 25 Claims



1. A fast fluidized bed reactor comprising:

an upright combustion chamber having an upper region with generally vertical peripheral walls and a lower region with walls including at least one generally downwardly and inwardly inclined peripheral wall for flow of a relatively dense layer of particles downwardly close to its surface;

an inlet in said combustion chamber for particulate material to be reacted;

an outlet disposed in the upper region of said combustion chamber for exhausting gas;

windbox means beneath said combustion chamber for maintaining fluidizing gas in said combustion chamber at a gas flow velocity in the bed of about 2–10 m/s;

a grid plate between said windbox means and said combustion chamber, said grid plate having openings for supplying gas from said windbox means to said combustion chamber to maintain said gas flow velocity in said bed, fluidize particulate material in the combustion chamber and provide an upward flow of gas and particles thereby transporting a portion of the particulate material out of the combustion chamber with the discharged exhaust gas;

a particle separator connected to said exhaust gas outlet for separating entrained particles from the exhaust gas, said separator having an outlet for clean gas and an outlet for particles connected to the lower region of the combustion chamber for recycling separated particles into the combustion chamber;

means spaced above the grid plate and disposed in said lower region at a height less than 1100 mm above said grid plate for changing the direction of flow of the particles flowing downwards close to the inclined wall and redirecting such particles for flow in a direction inwardly, to cross the upward flow of gas and particles, thereby preventing clogging and backflow of particles through the openings into the windbox means; and

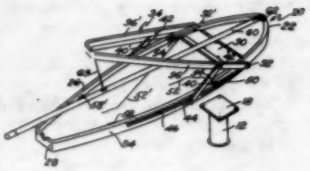
said direction changing means adjoining the inclined wall and directing the particles to flow in a direction away from the wall.

4,940,008

FOLDABLE MAST ASSEMBLY

John G. Hoyt, Two Harbor View Dr., Newport, R.I. 02840

Filed Sep. 5, 1989, Ser. No. 402,816
Int. Cl.[5] B63H *9/08*
U.S. Cl. 114—39.1 8 Claims



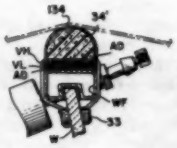
1. A foldable mast assembly for a sailboat comprising a stub mast, a wishbone boom, said boom mounted upon the stub mast, as mast pivoted on the boom, struts having one end pivotally affixed to the mast, means slidably connecting the other end to the boom and means for pulling the struts along the boom.

4,940,009

SHAPE ADAPTABLE PROTECTIVE CUSHION DEVICE AND METHOD OF MAKING AND USING SAME

Howard W. Keithley, Jr., 9221 Willow Lane, Adelphi, Md. 20783

Continuation-in-part of Ser. No. 717,793, Mar. 29, 1985, Pat. No. 4,694,774. This application Sep. 18, 1987, Ser. No. 98,321
Int. Cl.[5] B63B *17/00*
U.S. Cl. 114—343 2 Claims



1. A protective device for covers comprising:

a base member;

said member being made of material which is bendable and has a shaped form retention characteristic;

retaining means which can be attached to an element to fasten the device thereto including lateral projections integral with and made of the same material as said base member for retaining the shape form after being bent about said element;

cushioning means affixed to said base member;

additional retention means affixed to said base member for preventing longitudinal movement thereof after being mounted on appropriate support structure;

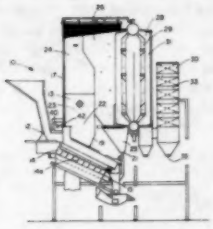
said additional retention means including at least one pad having a plurality of hooks, and a complementary pad of loops for permanent affixation on support structure.

4,940,010

ACID GAS CONTROL PROCESS AND APPARATUS FOR WASTE FIRED INCINERATORS

Peter Z. Kubin, and Jiri E. Stepan, both of Livingston, N.J., assignors to Ogden-Martin Systems, Inc., Fairfield, N.J.

Filed Jul. 22, 1988, Ser. No. 222,909
Int. Cl.[5] F23B 7/00
U.S. Cl. 110—233 10 Claims



1. An apparatus for incinerating waste material, comprising:
a furnace section having a turbulent combustion zone;
an additive injection device located adjacent to said turbulent combustion zone of said furnace section;
an additive metering and feeding device for supplying any one of a plurality of additives through said additive injection device and into said turbulent combustion zone of said furnace section to produce optimum adsorption reactions with combustion products of such waste materials;
a bulk storage silo for holding said additive;
a plurality of day bins connected to said bulk storage silo for receiving said additive and respectively supplying said additive to supply pipes;
an unloading device attached at one end to a top portion of said bulk storage silo and having an opposite end located at a point where additive can be supplied into said unloading device;
a venting device located on a top portion of said bulk storage silo and adapted to collect airborne matter;
a vibrating device formed along a portion of said bulk storage silo for vibrating said portion in order that additives stored therein flow freely out of said bulk storage silo;
a motorized metering feeder located adjacent to said vibrating device for controlling the flow rate of additives out of said bulk storage silo; and
a pneumatic conveying system attached to said bulk storage silo whereby additives are entrained into a pressurized air stream such that said additives are conveyed through said pneumatic conveying system to said day (surge) bins.

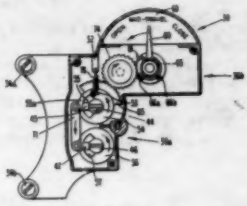
4,940,011

VALVE ACTUATOR TWO ROTOR THREE POSITION INDICATOR

Ivan E. Wilkerson, Lynchburg, and Robert W. Auxier, Forest, both of Va., assignors to Limitorque Corporation, Lynchburg, Va.

Filed May 19, 1989, Ser. No. 354,395
Int. Cl.[5] F16K 37/00; G01D 13/00
U.S. Cl. 116—277 6 Claims

4. A visual indicator for a valve actuator, that controls a valve stem, that is attached directly to the outer ends of two rotors connected to the geared limit switch of said actuator, comprising:
housing means attached to valve actuator;
a first means inside said housing means connected to a first rotor and rotatable therewith to drive a first lug;
a second means inside said housing means connected to a second rotor and rotatable therewith to drive a second lug;
a first gear means concentric with said first means and movably responsive to drive force exerted by said first lug;
a second gear means concentric with said second means and movably responsive to drive force exerted by said second lug;



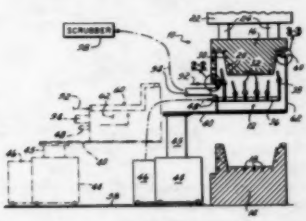
linking means for rotatably connecting said first and second gear means; and
indicator means connected to said first gear means and controllably rotatable between predetermined positions to show relative location of the valve stem.

4,940,012

MOLD COATING APPARATUS WITH AIR FLOW CONTROL NUMBERS

Richard J. Zimmerman, Grand Rapids, Mich.; Phillip R. Barnett, Amherst, and Larry Suter, Concord, both of Ohio, assignors to Nordson Corporation, Westlake, Ohio

Filed Dec. 23, 1986, Ser. No. 945,493
Int. Cl.[5] B05B 15/04
U.S. Cl. 118—301 11 Claims



1. Apparatus for coating a molded article comprising:
a first mold member,
a second mold member movable into engagement with said first mold member,
one of said mold members being retractable from and movable into engagement with the other mold member,
said mold members having facing wall portions defining a cavity when said mold members are interengaged, said mold members having shear edges, said shear edges being interengageable when said molds are moved into interengagement,
apparatus for depositing a powder material against a cavity defining portion of the wall of at least one of said mold members,
said powder depositing apparatus including a spray gun and means for flowing said powder material from said spray gun,
a movable frame,
said spray gun being mounted upon said movable frame,
means for moving said frame to align and misalign said spray gun with said cavity defining portion of the wall of said first mold member,
means for masking the shear edge of said first mold member

from the cavity defining portion of the wall of said first mold member, said masking means being mounted upon said movable frame, said masking means comprising

an air flow duct, said duct having side walls defining an air flow chamber contained internally thereof, said duct having an opening communicating with said chamber and located adjacent said shear edge of said first mold member,

first and second air flow control members mounted upon said duct, said control members having opposed edges spaced apart so as to define an air flow gap therebetween, said air flow gap being operable to direct air flow from said duct onto said shear edge of said first mold member so as to effectively mask said shear edge from powder sprayed onto the cavity defining portion of the wall of said first mold member.

4,940,013

APPARATUS FOR COATING FABRIC WEBS

Johannes Zimmer, Ebentalerstrasse 133, A-9020 Klagenfurt, Austria

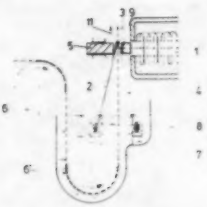
PCT No. PCT/AT87/00068, § 371 Date Sep. 2, 1988, § 102(e) Date Sep. 2, 1988, PCT Pub. No. WO88/03845, PCT Pub. Date Jun. 2, 1988

PCT Filed Nov. 18, 1987, Ser. No. 243,551

Claims priority, application Austria, Nov. 18, 1986, A3066/86; Nov. 18, 1986, A3070/86

Int. Cl.[5] B05C *11/02*

U.S. Cl. 118—62 **12 Claims**



1. Apparatus for use in coating a fabric web, comprising:

a first squeegee device movably mounted at a location on a first side of a plane;

a second squeegee device located on a second side of said plane opposite said first side; and

magnet means for magnetically forcing said first squeegee device toward said second squeegee device, such that when a fabric web with coating compound thereon is fed along said plane, said first and second squeegee devices will contact respective sides of said fabric web and smooth said coating compound therealong.

4,940,014

DEVELOPING DEVICE

Hiromitsu Saijo; Masamichi Hayashi, and Takeji Morikawa, all of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Sep. 29, 1988, Ser. No. 251,083

Claims priority, application Japan, Sep. 29, 1987, 62-245285

Int. Cl.[5] G03G *15/09*

U.S. Cl. 118—658 **15 Claims**

1. A developing device comprising:

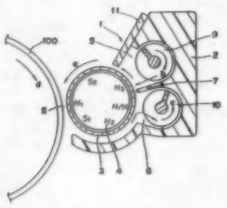
a latent image carrier means for carrying a latent image;

a casing having a sleeve chamber in which an upper chamber and a lower chamber are defined, the sleeve chamber being positioned adjacent the latent image carrier means with the upper and lower chambers disposed one above the other and on a side of the sleeve chamber remote from the latent image carrier means;

a developing sleeve rotatably supported in the device and housed within the sleeve chamber for delivering developing material to the latent image carrier means at a developing station, a fixed location defined at the outer peripheral surface of the sleeve confronting and spaced a predetermined distance from the latent image carrier means to define the developing station;

a conveyance means operatively housed within each of the upper and lower chambers for conveying developing material within the upper and lower chambers in respective directions opposite to each other and generally parallel to the central longitudinal axis of the developing sleeve;

a partition wall member extending generally parallel to the developing sleeve and separating said upper and lower chambers from each other, said partition wall defining a port at an end thereof that is downstream with respect to



the direction of conveyance of the developing material within the lower chamber, said port placing the upper and lower chambers in communication with each other; and

a plurality of magnets accommodated inside the developing sleeve and extending in a direction longitudinally of the developing sleeve while positioned circumferentially of the developing sleeve, said plurality of magnets including a weak magnetic pole disposed at a region confronting the conveyance means housed within the lower chamber and a strong magnetic pole generating a magnetic force of a magnitude greater than that generated by said weak magnetic pole, said strong magnetic pole disposed longitudinally of said weak magnetic pole in said sleeve at a region confronting both the conveyance means housed within the lower chamber and the port defined by the partition wall member.

4,940,015

PLASMA REACTOR FOR DIAMOND SYNTHESIS

Koji Kobashi, Nishinomiya; Kozo Nishimura, Kobe; Koichi Miyata, Akashi; Yoshio Kawate, Kobe; Kazuo Kumagai, Kobe; Norio Suzuki, Kobe; Yutaka Kawata, Kobe, and Kiyotaka Ishibashi, Kobe, all of Japan, assignors to Kabushiki Kaisha Kobe Seiko Sho, Kobe, Japan

Filed Jul. 13, 1989, Ser. No. 379,586

Claims priority, application Japan, Jul. 30, 1988, 63-190832; Nov. 15, 1988, 63-289641

Int. Cl.[5] C23E *16/50*

U.S. Cl. 118—723 **9 Claims**

1. A plasma reactor for diamond synthesis using a reaction gas comprising at least hydrogen and carbon atoms, capable of depositing diamond on a substrate placed in contact with a plasma produced by applying microwaves to the reaction gas to decompose the reaction gas, comprising:

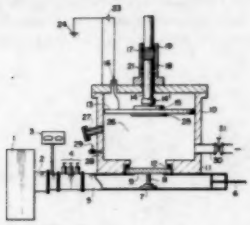
a microwave generator;

a waveguide having a rectangular cross section and connected to the microwave generator to guide the microwaves;

an antenna disposed on a quartz plate within the waveguide;

a microwave window facing the antenna and provided on the wall of the waveguide so as to extend perpendicularly to the axis of the antenna;

a reaction chamber defined by a cylindrical bottom member hermetically joined to the microwave window and the waveguide and provided with a circular hole to form a circular hole in the bottom wall of said reaction chamber, (b) an upper wall closing an upper end of the reaction chamber, and (c) a circumferential wall with a reaction gas inlet port and a gas outlet port; and



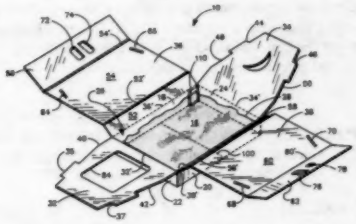
a substrate holder disposed within the reaction chamber in facing opposition to the microwave window, said substrate holder being movably mounted so as to be moved toward and away from the microwave window, so as to adjust the distance between the microwave window and the substrate holder.

4,940,016

UNITARY COLLAPSIBLE AND DISPOSABLE PET LITTER CONTAINER

Edward A. Heath, 465 Arapahoe, Boulder, Colo. 80302

Filed Mar. 18, 1988, Ser. No. 170,282
Int. Cl.[5] A01K *1/035*
U.S. Cl. 119—1 **21 Claims**



1. An integral, disposable pet litter container foldable between a collapsed state for storage and disposal and an enclosed, erect state for use, said container comprising:

a lower box portion defining a litter-containing receptacle, said lower box portion including bottom means having a plurality of overlapping bottom flap members to provide structural strength to contain litter in both said collapsed and erect states as well as to inhibit seepage therethrough, first and second pairs of oppositely disposed peripheral wall members extending upwardly from said bottom means to form said litter-containing receptacle therewith, and foldable top means having overlapping portions in said collapsed state for covering said lower box portion in said collapsed state for covering said lower box portion and providing structural strength and integrity in said collapsed state;

an upper box portion selectively extendable from said lower box portion, said upper box portion including front and rear panels extending upwardly from said first pair of oppositely disposed peripheral wall members of said lower box portion and adapted for selective folding into said lower box portion of storage when in said collapsed state, and a pair of side panels projecting upwardly from said second pair of oppositely disposed peripheral wall members of said lower box portion to overlap each other and form said foldable top means when in said collapsed state; and

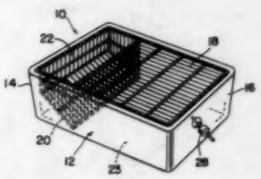
said side panels including means for interlocking with said front and rear panels to selectively maintain said container in said erect state and further including top flap members for overlapping engagement aligned substantially parallel to said bottom means when in said erect state, and including means for interconnecting the same, to form a top, substantially horizontal surface for said container to totally enclose said container and to provide a substantial width dimension at the top of said erect container for ample pet head room therewithin, said front panel having means for pet entry into and from the interior of said enclosed, erect container.

4,940,017

CAGE, ESPECIALLY FOR SMALL EXPERIMENTAL ANIMALS

Etsuko Niki; Motohiro Niki, both of 2-22-11, Yushima, Bunkyo-ku, Tokyo-To, Japan; Kap J. Lee, R.R. #1, Box 123, Grand Forks, N. Dak. 58201; Misako Niki, and Mieko Niki, both of 2-22-11, Yushima, Bunkyo-ku, Tokyo-To, Japan

Filed Oct. 11, 1988, Ser. No. 256,309
Claims priority, application Japan, Oct. 30, 1987, 62-273318
Int. Cl.[5] A01K *1/03*
U.S. Cl. 119—18 **10 Claims**



1. A cage especially well suited for confining experimental animals, comprising:

(a) horizontally slidingly shiftable enclosure means including a casing for confining an animal, said casing having a vertical side wall;

(b) there being a hole defined in the side wall of the casing;

(c) a water dispenser fixedly connected to a stationary water conduit and having a stationary spout inserted in the casing through the hole therein for supplying water to the confined animal; and

(d) a connector cup of elastic material hermetically and fixedly mounted to the spout of the water dispenser, the connector cup having an open end held against an outer surface of said wall of the casing around said hole, said casing being held in position with the outer surface of the casing in pressed contact with the connector cup;

(e) whereby the enclosure means and the water dispenser can be readily interconnected as the elastic connector cup is pressed against the outer surface of the casing with the shifting movement of the enclosure means toward the water dispenser.

4,940,018

TOY FOR CATS

Theodore L. Edling, P.O. Box 593, Bethel Island, Calif. 94511

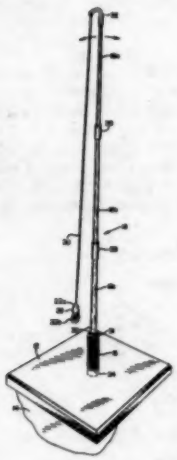
Filed Oct. 20, 1987, Ser. No. 111,816
Int. Cl.[5] A01K *15/02*
U.S. Cl. 119—29 **13 Claims**

1. A toy for exercising cats, comprising,

a base for resting on a floor or other surface and for stabilizing the toy,

a flexible rod,

resilient means positioned between the base and a base end of the flexible rod, for connecting the base end of the flexible rod to the base and for facilitating resilient swinging pendulum-like movement of the rod from a generally vertical position through angular tilting movements with respect to the base, said resilient means tending to bring the flexible rod back up to the generally vertical position, and including means associated with the resilient means for permitting quick removal of the flexible rod from the base so that the rod can be held manually by its base end, said resilient means comprising a coil spring fixed to the base and extending upwardly a short distance from the base, and sized to slidingly receive in its upper end the base end of the flexible rod,



a flexible line member extending from an upper end of the flexible rod, opposite the base end of the rod, hanging down from the upper end of the rod and extending near to the base in a rest position of the toy, and

a toy member connected to a lower end of the flexible line member,

means for offsetting the toy member slightly laterally away from the flexible rod as the rod sits in the spring in the base, in a normal rest position of the toy member,

whereby the toy member hanging from the flexible rod attracts play by a cat, and when the toy member is batted by the cat it moves in a complex pattern due to pendulum type motions of the line member and of the flexible rod line the coil spring, teasing the cat and inducing further play, and whereby the flexible rod maybe removed from the spring in the base so that a person can tease and play with the cat manually using the rod, the line and the toy member.

4,940,019

RECYCLING BIRD FEEDER

Jerry W. Coffer, 3207 S.E. 36th, Portland, Oreg. 97202

Filed May 31, 1988, Ser. No. 201,075

Int. Cl.[5] A01K *39/01*

U.S. Cl. 119—522 **7 Claims**

1. A bird feeder comprising:

(a) a first chamber for holding seed and other feed material;

(b) said first chamber having at least one feed opening defined therein to provide access to feed material contained therein;

(c) baffle means for preventing feed material from flowing freely out of said feed opening;

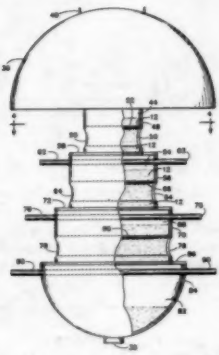
(d) perch means for supporting a bird, said perch means being located below said feed opening;

(e) a second chamber located below said first chamber, said second chamber having at least one second feed opening defined therein;

(f) second baffle means for preventing feed material from flowing freely out of said second feed opening;

(g) second perch means for supporting a bird, said second perch means being located blow said second feed opening;

(h) conduit means having an inlet positioned above said perch means and adjacent to said feed opening and communicating with said second chamber for passing feed material which is discharged from said feed opening by a bird into said second chamber;



(i) a third chamber located below said second chamber; and

(j) second conduit means having an inlet positioned above said second perch means and adjacent to said second feed opening in communicating with said third chamber, for passing feed material which is discharged from said second feed opening into said third chamber.

4,940,020

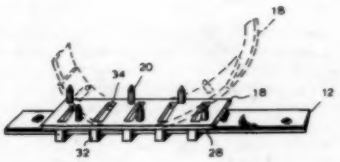
ANIMAL RESTRAINING AND TRAINING DEVICE

Richard A. Gordon, 95 W. 3rd St., Freeport, N.Y. 11520

Filed Aug. 17, 1988, Ser. No. 233,213

Int. Cl.[5] A01K *1/06*

U.S. Cl. 119—106 **9 Claims**



1. An animal collar comprising a cincture adapted to be removably fastened about the neck of the animal and a bendable strip having two opposed surfaces, said strip having a plurality of outwardly extending protuberances integrally formed on one surface and a plurality of guide elements on the other surface for slidably receiving said cincture, said cincture and strip being positionable about the neck of the animal so that when said cincture is fastened about the neck of the animal, the strip is bent into an arc transverse to its length to conform to the shape of the neck, the outer ends of said protuberances touch said animal and said strip and cincture are movable relatively to each other.

4,940,021

FLOATING DOCK

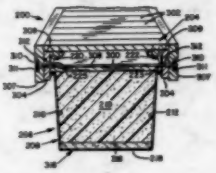
David H. Rytand, 2402 Killarney Way, S.E., Bellevue, Wash. 98004

Continuation of Ser. No. 106,150, Oct. 8, 1987, Pat. No. 4,887,654, which is a continuation-in-part of Ser. No. 816,204, Jan. 6, 1986, Pat. No. 4,709,647. This application May 30, 1989, Ser. No. 344,663

Claims priority, application New Zealand, Oct. 15, 1986, 217943

Int. Cl.[5] B63B *35/38*

U.S. Cl. 114—267 3 Claims



1. A float module for floating docks, said float module comprising:

a hollow open top container having a single contiguous bottom wall, end walls and sidewalls which together define a floatation chamber, said container containing a buoyant material to provide positive buoyancy to said container when water is admitted thereto;

a pair of opposing, load distributing flexural flanges integral with and extending upwardly one from each sidewall of said container; and

a compression resistant panel extending across the open top of said container and abutting said opposing flanges;

said container walls having at least one open hole therethrough at a location such that it will be positioned beneath the surface of the water when the float module is in operative floating position in a body of water and through which hole water can freely enter and leave said floatation chamber to ballast said module.

4,940,022

FEEDING GATE

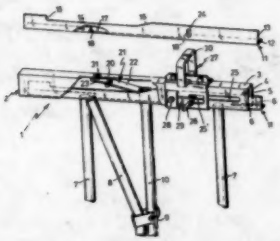
Pieter Spinder, Le Harkema, Netherlands, assignor to Spinder Stallinrichting B.V., Le Harkema, Netherlands

Filed Dec. 14, 1988, Ser. No. 284,917

Claims priority, application Netherlands, Dec. 16, 1987, 8703045

Int. Cl.[5] A01K *1/08*

U.S. Cl. 119—148 12 Claims



1. A feeding gate comprising a number of feeding openings that can be opened and closed by means of tiltable closing pipes and having a closing mechanism that can be unlatched or latched, respectively, by means of an operating member comprising recesses and being disposed entirely within an upper profile beam by sliding this operating member in the longitudinal direction of the profile beam, said recesses being disposed in the immediate vicinity of a latch that is mounted pivotably in the profile beans, said latch having an end that is automatically received in one of the recesses upon latching, which latching operation can be disconnected for all closing pipes simultaneously or for each closing pipe separately, characterized in that:

the operating member (11) has a first recess (17) having opposite ends for centrally closing and centrally opening the feeding openings, and a second recess (14) terminating in an obliquely rising edge (16) for centrally unlatching the closing pipe (10).

4,940,023

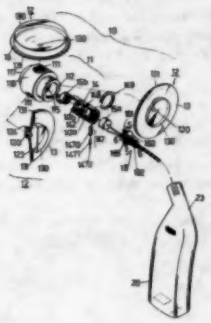
HIGH RESOLUTION STETHOSCOPIC APPARATUS

Ming-Jeng Shue, No. 14, Lane 8, Chung-I Street, Taichung City, Taiwan

Filed Nov. 17, 1988, Ser. No. 272,312

Int. Cl.[5] A61B *7/02*

U.S. Cl. 128—715 12 Claims



1. A stethoscopic apparatus comprising:

a handle member both for the installation of sound transmission circuit devices and for use as a handle;

a chestpiece assembly having a housing member with a rotatable shaft member positioned therein, a plurality of chestpieces attached on said housing member; and

an adaptor means disposed between said handle member and said chestpiece assembly, having means for connecting with said handle member and said rotatable shaft member of said chestpiece assembly;

wherein each of said chestpieces comprises a substantially concaved disc-shaped base member having a stem formed thereon and a sound transmission opening formed in the stem, and a resonance membrane having a shape conforming to that of said base member; said resonance membrane further including an engaging rim for engaging with said base member and a plateau-shaped protrusion integral with said membrane;

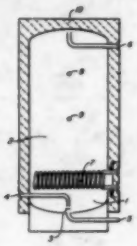
said plateau-shaped protrusions having a height of about one to two times the diameter of said sound transmission opening of said base member of said chestpiece.

4,940,024

HOT WATER HEATER

Joachim Grabietz, Altgeadorferstr. 41, Burgkirchen, Fed. Rep. of Germany 8269, assignor to Hans Terhorst, Burghausen and Joachim Grabietz, Neuotting, both of, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,604
Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720900
Int. Cl.[5] F22B 5/00
U.S. Cl. 122—13 R 9 Claims



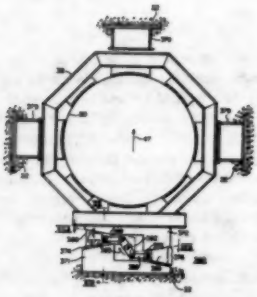
1. Hot water heater comprising a storage container having means through which hot and cold water flows for consumption by separately withdrawing hot and cold water from the container, a cold water inlet in the lower region of the container, a hot water outlet in the upper region of the container, a heating element arranged in the storage container, and a cold water outlet provided in the lower region of the container through which outlet cold water flows, said cold water outlet being for connection to a cold water domestic supply.

4,940,025

STEAM GENERATOR UPPER SUPPORT HAVING THERMAL DISPLACEMENT COMPENSATION

Howard L. Ott, Kiski Township, Armstrong County, and Steven A. Palm, N. Huntingdon, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Mar. 6, 1989, Ser. No. 319,591
Int. Cl.[5] F22B 37/24
U.S. Cl. 122—510 24 Claims



1. A radial support assembly providing for a direct load path for loading forces between a generally cylindrical shell member and a housing generally surrounding the shell member, the support assembly also allowing for free thermal expansion and contraction of the shell member to be supported, said radial support comprising:

a ring girder generally encircling the shell member to be supported;

a plurality of rigid support blocks secured to the housing and radially spaced about the shell member; and

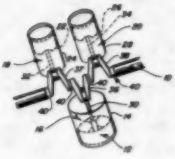
compensating support means operably associated with the housing and the ring girder and disposed proximate to the load path, said compensating support means responsive to said thermal expansion and contraction wherein a nominal gap is substantially maintained between said rigid support blocks of the support arrangement and the ring girder such that said loading forces are resisted by the radial support assembly.

4,940,026

INTERNAL COMBUSTION ENGINE WITH BALANCING FORCES

Martin A. Fisher, 8308 S.W. 103rd Ave., Miami, Fla. 33173

Continuation-in-part of Ser. No. 49,308, May 13, 1987, abandoned. This application Nov. 25, 1988, Ser. No. 275,904
Int. Cl.[5] F02B 75/06
U.S. Cl. 123—53 R 15 Claims



1. An internal combustion engine of the opposed cylinder type comprising:

(a) a crankshaft and at least one set of pistons movably connected thereto, each piston of said one set reciprocally mounted within a separate corresponding cylinder and rotatably drive said crankshaft during a power stroke thereof,

(b) said one set of pistons including at least a first piston and cylinder assembly mounted on one side of said crankshaft and at least a second and a third piston and cylinder assembly mounted on the other side of said crankshaft in directly opposed relation to said first piston and cylinder assembly,

(c) each of said cylinders of said second and third piston and cylinder assemblies comprising one half the displacement volume of said cylinder of said first piston and cylinder assembly,

(d) whereby vibration of the engine is substantially reduced at all running speeds.

4,940,027

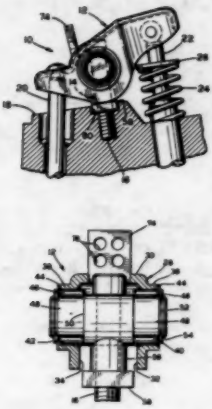
MARINE ENGINE WITH WATER COOLED FUEL LINE FROM REMOTE TANK

John F. Garms, Menasha, Wis., assignor to Brunswick Corp., Skokie, Ill.

Filed Apr. 15, 1988, Ser. No. 182,485
Int. Cl.[5] F02M 31/20; F02B 47/00
U.S. Cl. 123—73 AD 5 Claims

1. A marine propulsion system comprising a water cooled internal combustion engine, a remote fuel tank, a conduit connected between said fuel tank and said engine, said conduit having a first passage supplying fuel from said tank to said

engine, said conduit having a second passage supplying cooling water from said engine towards said tank, said conduit having a third passage returning water from said second passage back to said engine.



4,940,028

RECOIL PULL ROPE REEL APPARATUS FOR INTERNAL COMBUSTION ENGINES

Lloyd H. Tuggle, Shreveport, La., assignor to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Feb. 8, 1989, Ser. No. 308,316

Int. Cl.[5] F02N *3/02*

U.S. Cl. 123—185 B **11 Claims**

1. A rope reel for use in conjunction with a pull rope in a manual, recoil type starting system in an internal combustion engine, said rope reel comprising:

a hub extending along an axis;

first and second radially outwardly projecting flanges coaxially secured to said hub in an axially spaced relationship thereon and defining therebetween an annular cavity within which the pull rope may be operatively wound, each of said first and second flanges having outer and inner sides, an axial portion of said hub projecting outwardly from said first flange;

anchoring means, positioned on said outer side of said first flange, for clampingly securing an inner end portion of the pull rope on said outer side of said first flange; and

a first aperture formed axially through said first flange radially adjacent said projecting axial portion of said hub, said first aperture being sized, and circumferentially positioned on said first flange, in a manner permitting a second portion of the pull rope adjacent the clamped inner end portion thereof to be at least partially looped around said projecting axial portion of said hub and the free end of the pull rope inserted inwardly through said first aperture into said annular cavity and moved radially outwardly therethrough to snug the second pull rope portion around said projecting axial portion of said hub and ready the pull rope for operative winding thereof within said annular cavity;

said anchoring means being operative to clamp a looped inner end portion of the pull rope on said outer side of said first flange and position said looped inner end portion to extend externally around said first aperture in a manner permitting said second pull rope portion to be wrapped entirely around said projecting axial portion to be wrapped entirely around said projecting axial portion of said hub, and permit the free and portion of the pull rope to be inserted sequentially through said looped inner end portion, inwardly through said first aperture and into said annular cavity for subsequent movement radially outwardly therethrough.

4,940,029

TURBOCOMPOUNDED TWO-STROKE PISTON ENGINES

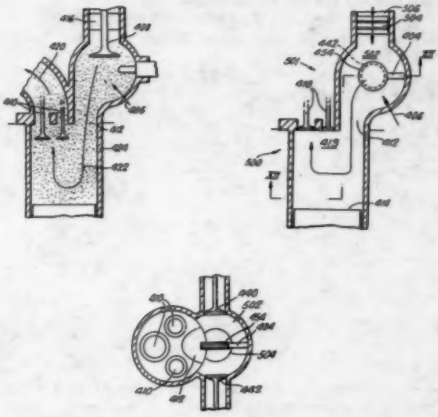
John A. J. Rees, 7 Hollies Close, Newton Solney, Burton-on-Trent, Staffordshire, DE15 OSB, England

Continuation-in-part of Ser. No. 273,922, Nov. 21, 1988, abandoned, which is a continuation of Ser. No. 104,059, Sep. 16, 1987, Pat. No. 4,807,579. This application Oct. 27, 1989, Ser. No. 428,007

Claims priority, application United Kingdom, Jan. 16, 1986, 8601065

Int. Cl.[5] F02B *75/02*

U.S. Cl. 123—257 **6 Claims**



1. A turbocompounded 2-stroke piston engine having a cylinder head incorporating, for each cylinder of said piston engine, an indirect combustion chamber, inlet valve means for admitting turbocharging air to the cylinder, and exhaust valve means for exhausting combustion gases from the cylinder, the piston engine being adapted to perform an operating cycle, comprising a compression stroke and an expansion stroke, in which the expansion stroke expands the combustion gases to a pressure lower than the incoming turbocharging air, and in which scavenging of the combustion gases from the cylinder is

facilitated by arranging that both the inlet valve means and the exhaust valve means are open at the same time during an early part of the compression stroke so as to purge the cylinder with turbocharging air during said early part of the compression stroke, whereby the cylinder has a compression ratio which is substantially less than its expansion ratio; wherein the inlet valve means is incorporated in the indirect combustion chamber such that when the inlet valve means is open, the incoming turbocharging air flows through the indirect combustion chamber before entering the cylinder, the indirect combustion chamber having a cross-sectional area which decreases towards the cylinder to form passage means for connecting the indirect combustion chamber to the cylinder and directing the incoming turbocharging air towards the piston thereby to displace the combustion gases towards the exhaust valve means and maximize the efficiency of said scavenging, said passage means having a smaller cross-sectional area than said indirect combustion chamber to assist in directing incoming turbocharging air towards the piston so as to displace combustion gases towards the exhaust valve means, said exhaust and inlet valve means and said cylinder each having selected diameters with the sum of the diameters of the exhaust valve means and the inlet valve means being greater than the diameter of said cylinder, said passage means occupying a smaller portion of the cylinder head area than the exhaust valve means and the area of the inlet valve means in the indirect combustion chamber being substantially greater than the minimum cross-sectional area of said passage means, whereby mass flow rates of turbocharging air and combustion gases into and out of the cylinder are maximized and scavenging of combustion gases by turbocharging air is facilitated.

4,940,030

ABNORMALITY DETECTING SYSTEM FOR AN AUTOMOTIVE ENGINE

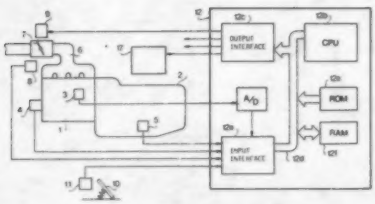
Koji Morikawa, Musashino, Japan, assignor to Fuji Jukogyo Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 341,145

Claims priority, application Japan, Apr. 30, 1988, 63-059605[U]

Int. Cl.[5] F02B *77/00*

U.S. Cl. 123—198 D **3 Claims**



1. A system for detecting abnormality of an automotive engine for a motor vehicle having an accelerator pedal for controlling a throttle valve of the engine, comprising:

an accelerator sensor for detecting a depression degree of the accelerator pedal and for producing an accelerator signal;

an engine speed sensor for detecting an engine speed and for producing an engine speed signal;

a torque sensor for detecting output torque of the engine and for producing a torque signal representing the detected torque;

storing means for storing reference torques arranged in accordance with the depression degree of the accelerator pedal and the engine speed;

comparator means for comparing the detected torque represented by the torque signal with a reference torque derived from the storing means in accordance with the accelerator and the engine speed signals and for producing an abnormality signal when the detected torque deviates from a permissible range with respect to the derived reference torque; and

indicator means responsive to the abnormality signal for indicating an abnormality.

4,940,031

SETTING DEVICE FOR A FEED DEVICE OF AN INTERNAL COMBUSTION ENGINE

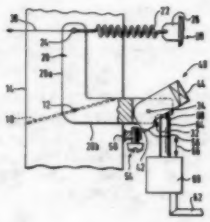
Arnold Mann, Biebergemünd, Fed. Rep. of Germany, assignor to VDO Adolf Schindling AG, Frankfurt am Main, Fed. Rep. of Germany

Filed Jul. 14, 1989, Ser. No. 381,123

Claims priority, application Fed. Rep. of Germany, Aug. 12, 1988, 3827408

Int. Cl.[5] F02D *41/16*

U.S. Cl. 123—339 **13 Claims**



1. In a setting device for a feed device of an internal combustion engine with idling speed-of-rotation control, the setting device comprising

a displacement rod, a return spring, a first adjustable stop, a second fixed stop, and an actuating lever of the feed device; and wherein

the feed device is connected to the displacement rod and is pretensioned by the return spring;

the first adjustable stop and the second fixed stop are operative with the actuating lever of the feed device, the second fixed stop limiting the range of adjustment of the first stop for a minimum setting of the feed device; and wherein

the feed device further comprises a mechanical reset means, and an adjustable abutment element which cooperates with the fixed stop and the adjustable stop;

the abutment element is located on the actuating lever of the feed device, and is acted on by the mechanical reset means;

the abutment element, upon normal idling operation of the idling speed-of-rotation control is in engagement with the first adjustable stop and is disposed, against an action of the reset means, in a position out of engagement with the second fixed stop; and

the abutment element, in the event of an abnormal idling speed operating condition of the idling speed-of-rotation control in which the abutment element is out of engagement with the first adjustable stop and then reset, is in engagement, under the action of the reset means, with the fixed stop and holds the actuating lever for the feed device to permit an adjustment of the feed device somewhat greater than the minimum adjustment.

4,940,032

FUEL BOOSTING SYSTEM FOR INTERNAL COMBUSTION ENGINE

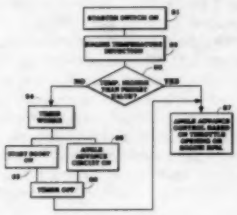
Hiroaki Fujimoto, Hamamatsu, Japan, assignor to Sanshin Kogyo Kabushiki Kaisha, Hamamatsu, Japan

Filed Jun. 30, 1989, Ser. No. 374,292

Claims priority, application Japan, Jul. 4, 1988, 63-166558

Int. Cl.[5] F02D *43/00*

U.S. Cl. 123—424 **9 Claims**



1. In an internal combustion engine including a crankcase, a crankshaft rotatably journaled in said crankcase and an intake manifold, the improvement comprising an automatic fuel boosting system including means for sensing if the engine temperature at the time of starting is below a predetermined value, means for supplying an optimum amount of fuel to the engine intake manifold based on the engine temperature, means, responsive to said sensing means, for advancing the ignition angle based on the engine temperature and means, responsive to said advancing means, for actuating said supply means based on the engine temperature, if said engine temperature is sensed to be below the predetermined value.

4,940,033

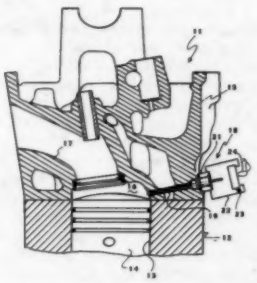
METHOD OF OPERATING AN ENGINE AND MEASURING CERTAIN OPERATING PARAMETERS

Steven L. Plee, Northborough; Peter Hartman, Worcester, both of Mass.; Jay K. Martin, Madison, Wis.; J. Paul Nolan; Donald J. Remboski, Jr., both of Northborough, Mass., and Richard R. Ross, Shrewsbury, Mass., assignors to Barrack Technology Limited, Marlborough, Mass.

Continuation of Ser. No. 193,918, May 13, 1988. This application Nov. 3, 1988, Ser. No. 266,682

Int. Cl.[5] F02D *41/22*; F02P *5/14*; G01L *23/22*

U.S. Cl. 123—425 **19 Claims**



1. The method of operating an internal combustion engine having a combustion chamber, means for forming a combustible fuel/air mixture within the combustion chamber and means for detecting the luminosity within the combustion chamber in the range of wave lengths about 300 nm to about 947 nm during each cycle of operating of the engine from prior to the initiation of combustion until after the completion of the combustion process, and adjusting the fuel/air ratio to maintain the desired luminosity characteristic.

4,940,034

CONTROL CIRCUIT AND METHOD FOR CONTROLLING THE SPEED OF AN ELECTRIC FUEL PUMP FOR AN INTERNAL COMBUSTION ENGINE EQUIPPED WITH FUEL INJECTION

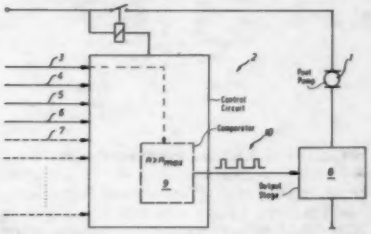
Hans Heim, Stuttgart, and Hermann-Josef Klein, Eberdingen-Hochdorf, both of Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Filed Jan. 6, 1989, Ser. No. 294,732

Claims priority, application Fed. Rep. of Germany, Jan. 7, 1988, 3800177

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—497 **4 Claims**



1. A control circuit for an internal combustion engine equipped with a fuel injection system wherein a pressure is generated in the system for injecting the fuel, the control circuit comprising:

an input for receiving an input signal having a magnitude indicative of the speed (n) of the engine;

control means connected to said input for receiving said input signal and for controlling and adapting the speed and delivery rate of said fuel pump to the quantity of fuel required by the engine;

speed limit-value means for controlling the speed of said fuel pump to a speed value below a minimum value when the speed (n) of the engine exceeds or is about to exceed a specific predetermined maximum speed (n_{max}), said speed value of said pump being sufficient for maintaining the system pressure in said system for injecting the fuel; and,

said speed limit-value means being a comparator which includes a unit for determining the speed gradient of the speed of the engine, said speed gradient being applied for controlling the speed and delivery rate of the fuel pump.

4,940,035

VARIABLE FLOW RATE PUMP FOR FLUID

Peter Waring, Wainuiomata, New Zealand, assignor to Her Majesty the Queen in right of New Zealand, New Zealand

Filed Nov. 9, 1988, Ser. No. 269,243

Claims priority, application New Zealand, Nov. 10, 1987, 222499

Int. Cl.[5] F02M *39/00*; F04B *1/28*

U.S. Cl. 123—497 **13 Claims**

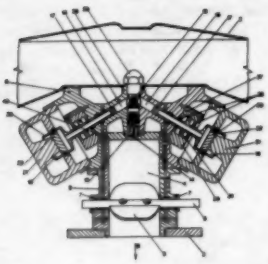
1. An internal combustion engine fuel or fuel injection pump for delivering fuel to an engine over a range of fuel flow rates and engine operating condition, comprising:

at least two reciprocating fluid delivery mechanisms fluid flow connected to each other and to an outflow from the pump and able to operate at a frequency sufficient to enable the phase of operation of the fluid delivery mechanisms relative to one another to be varied in a response time enabling the flow rate of fuel from the pump to

satisfy or substantially satisfy the changing fuel requirements of the engine as the engine speed or load varies;

electromagnetic means associated with each fluid delivery mechanism for driving same;

means for providing alternating electric energizing currents to each said electromagnetic means for driving the fluid delivery mechanism, in a manner enabling alteration of the phase relationship between said electric energizing currents for varying said phase of operation of the fluid delivery mechanisms relative to one another and thus the delivery rate of fuel from the pump, with said alternating electric energizing currents driving said fluid delivery mechanisms at said frequency sufficient to enable the operation of the fluid delivery mechanisms relative to one another and thus permitting the flow rate of fuel from the pump to be varied in a response time enabling the pump to satisfy or substantially satisfy the changing fuel requirements of the engine as the engine speed or load varies, over said range of engine operating condition.



4,940,036

FUEL INJECTION PUMP

Gérard Duplat, Vaugneray, France, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

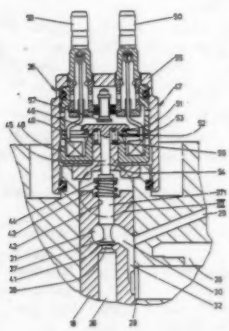
PCT No. PCT/DE88/00312, § 371 Date Feb. 13, 1989, § 102(e) Date Feb. 13, 1989, PCT Pub. No. WO88/09868, PCT Pub. Date Dec. 15, 1988

PCT Filed May 28, 1989, Ser. No. 315,895

Claims priority, application Fed. Rep. of Germany, Jun. 13, 1987, 3719832

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—506 **9 Claims**



1. A distribution fuel injection pump for delivering fuel to a plurality of injection nozzles of an internal combustion engine, said distribution fuel injection pump comprising an inlet communicating with a source of fuel; an outlet for delivering fuel to the injection nozzles; a pump working space communicating with said inlet and outlet; at least one pump plunger defining at least partially said pump working space; a rotatable distributor piston having a distributor bore communicating said pump working space with said outlet; and a control valve for controlling fluid flow through said outlet, said distributor piston comprising a relief bore communicating with a relief space, said control valve comprising a valve opening located in said distributor piston and connecting said distribution and relief bores, a valve member located in said distributor piston for controlling fluid flow through said valve opening to thereby control the fluid flow between said distribution bore and said relief bore, and an electromagnet for controlling movement of said valve member; said distributor piston comprising an axial guide bore, said valve member being formed as a valve needle having an end remote from said valve opening, said control valve further including a tappet actuated by said electromagnet and engaging said remote end, and a spring for biasing said valve needle to an open position thereof, said electromagnet having an armature, said tappet having a rounded front end engaging said remote end of said valve needle.

4,940,037

FUEL INJECTION SYSTEM FOR INTERNAL COMBUSTION ENGINES

Konrad Eckert, Stuttgart, Fed. Rep. of Germany, assignor to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

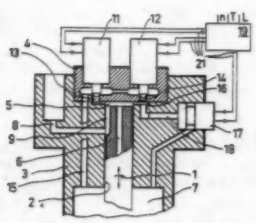
PCT No. PCT/DE88/00350, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO89/00242, PCT Pub. Date Jan. 12, 1989

PCT Filed Jun. 11, 1988, Ser. No. 347,887

Claims priority, application Fed. Rep. of Germany, Jul. 6, 1987, 3722264

Int. Cl.[5] F02M *39/00*

U.S. Cl. 123—506 **14 Claims**



1. A fuel injection system for an internal combustion engine, said fuel injection system comprising:

a high-pressure pump including pump work space and means for delivering a constant fuel quantity per a pump cycle from said pump work space;

a first relief duct for returning a first return flow quantity;

first open/close control means for controlling the first flow quantity flowing through said first relief duct to thereby determine a start and an end of the delivery;

a second relief duct for returning a second return flow quantity and including a control throttle; and

electronic control means for controlling the fuel delivery in accordance with characteristic values of the internal combustion engine and said high-pressure delivery pump;

said control throttle having a constant cross-section, said fuel injection system further comprising quantity measuring means located in said second relief duct for measuring the second return flow quantity and a second open/close control means for controlling the second return flow quantity, said electronic control means comprising means for controlling the flow delivery in accordance with characteristic values of said quantity measuring means and said second open/close control means and in accordance with

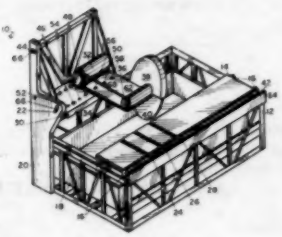
the constant fuel delivery quantity also used as a characteristic value.

4,940,038

TILE AND MARBLE CUTTING SAW APPARATUS AND METHOD

Kevin M. O'Keefe, 18 Suffolk Ave., West Yarmouth, Mass. 02673

Filed Feb. 1, 1989, Ser. No. 305,415
Int. Cl.[5] B28D 1/04
U.S. Cl. 125—13.01 14 Claims



1. A masonary cutting apparatus, which apparatus comprises in combination:

(a) a table support with a horizontal surface having a longitudinal and a lateral axis;

(b) a tray means on the horizontal surface of the table support, the tray means longitudinally moveable between a masonry cutting position wherein the masonry on the tray is cut, and a masonry non-cutting position;

(c) a motor means;

(d) a circular blade cutting means driven by the motor means, the circular blade cutting means adapted to cut masonry in a cutting position;

(e) a shelf support means to support the motor means and the cutting blade means and to move the motor means and the cutting blade means laterally on the shelf support means between preselected masonry cutting positions;

(f) locating means to locate the motor means and the cutting blade means in a preselected cutting position on the shelf support means;

(g) securing means to secure the located motor means and cutting blade means in the preselected cutting blade position and to permit the release of the securing means so that the motor means and cutting blade means can be easily moved laterally to a different preselected cutting position; and

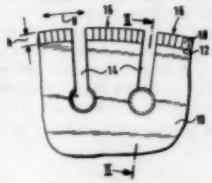
(h) the tray means characterized by a plurality of generally longitudinally, preselected cutting grooves placed therein in preselected positions to permit the cutting blade means to cut the masonry in the preselected located and secured cutting positions, the grooves in the tray means matching the preselected, secured located position of the motor means and the cutting blade means for each preselected cutting position to which the motor means and the cutting blade means are laterally moved.

4,940,039

CUTTING TOOL

Rudolf Buettner, Schelde-Lahn-Strasse 8, D-6345 Escheburg 4, Fed. Rep. of Germany

Continuation of Ser. No. 180,403, Apr. 12, 1988, abandoned.
This application Aug. 8, 1989, Ser. No. 391,678
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1987, 3712953
Int. Cl.[5] B28D 1/04
U.S. Cl. 125—15 6 Claims



1. A cutting tool for cutting of natural stone, concrete, ceramics and the like, comprising:

a very large diameter disk having means defining a plurality of circumferentially spaced cutting segments on the periphery of said disk, said cutting segments being separated by means defining radially outwardly opening and axially opening grooves adapted to receive chip material so that it can be discharged during a cutting operation, said cutting segments each having a circumferentially extending length and means thereon for defining at least a pair of cutting pieces with the entire length of each cutting piece, including axially oppositely facing sidewalls thereof, having a uniform axial thickness and at least one of a wave-shape, or zigzag-shape in the circumferential direction, mutually adjacent and opposing axially facing cutting piece surfaces being spaced from one another to define a radially outwardly opening, continuous circumferentially extending channel therebetween, means on each cutting piece defining plural apex portions and plural grooved portions alternately spaced along the length of each cutting piece, said apex portions on one side of one cutting piece being received in said grooved portions on a side of the other cutting piece facing said one side to thereby provide a blockage to the otherwise unobstructed continuity of said circumferentially extending channel in a plane of rotation of said disk.

4,940,040

ADJUSTABLE COOKING OVEN

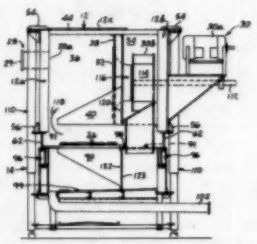
James E. Randall; Ronald D. Lemke, both of Huron, and Robert A. Mesteller, Toledo, all of Ohio, assignors to Stein, Inc., Sandusky, Ohio

Filed Jan. 31, 1989, Ser. No. 304,368
Int. Cl.[5] F24C 15/32
U.S. Cl. 126—21 A 27 Claims

1. A food cooking oven comprising an upper hood means and base means which are separable from one another and define a substantially closed vapor leak proof enclosure except for an inlet and outlet in said enclosure, wherein said hood means comprises side walls, end walls, and a top wall, and said base means comprises side walls, end walls and a bottom wall, said enclosure defining a cooking chamber for receiving food product therein, means for conveying food product through said chamber from said inlet and exiting through said outlet, heater means extending through a wall of said cooking chamber for heating a gaseous medium, suction fan means on a wall of said cooking chamber in relatively closely spaced relation from an outlet of said heater means, a source of moisture disposed in relatively closely spaced relation to said outlet of said heater means for mixing moisture with said gaseous medium

from said heater means, means disposed above and below said conveying means for directing said gaseous medium to opposite sides of said conveying means for impingement onto and cooking of food products thereon, a second chamber separate from said cooking chamber and in communication with the pressure side of said fan means for directing the mixture of gaseous medium and moisture to said means disposed above and below said conveying means for impingement of said gaseous medium onto said food products, wherein at least certain ones of said means disposed above and below said conveying means are adapted to be selectively movable relative to said conveying means during operation of said oven so as to vary the cooking characteristics of the oven.

25. A method of cooking food products in an oven including a substantially closed vapor leak proof elongated enclosure having an inlet and outlet in opposite end walls of the enclosure, and including conveyor means for conveying food product through the cooking chamber in said enclosure from said inlet and exiting through said outlet, wherein said enclosure



includes separable hood means and base means, comprising providing a source of gaseous cooking medium and directing it into said cooking chamber, applying moisture to said cooking medium closely adjacent to said source of gaseous cooking medium and then sucking by fan means the moisturized cooking medium from said cooking chamber into another chamber separate from but adjacent to said cooking chamber, then forcing the moisturized cooking medium via said other chamber to means disposed above and below said conveying means for directing said gaseous medium toward the respective confronting surfaces of said conveyor means to cause impingement of said gaseous cooking medium on the food product, and then recirculating said cooking medium from said cooking chamber back into said other chamber via said fan means, and providing for adjustment of the elevation of at least certain of said means disposed above and below said conveying means during operation of said oven whereby the cooking characteristics of the oven may be varied and the cooking operation may be optimized.

4,940,041

HEATER HAVING A CASING WITH AN INTEGRALLY CAST MOUNTING SPACE FOR CONTROL COMPONENTS

Josef Riedmaier, Pentenried; Friedrich Widemann, and Bernhard Schmatelka, both of Munich, all of Fed. Rep. of Germany, assignors to Webasto AG Fahrzeugtechnik, Gauting, Fed. Rep. of Germany

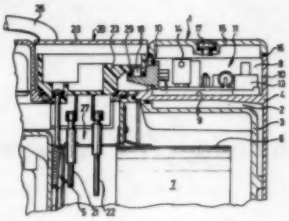
Filed Mar. 3, 1989, Ser. No. 318,543

Claims priority, application Fed. Rep. of Germany, Jul. 3, 1988, 3807397

Int. Cl.[5] F24H *3/02*

U.S. Cl. 126—110 R **24 Claims**

1. A vehicle auxiliary heater, of the type which operates with a liquid heat exchange medium that flows through a space between a heat exchanger and a jacket-like outer casing and having a control device with inputs and outputs for controlling essential operating parts, said parts comprising at least one of a combustion air fan, ignition device, flame monitor, circulating device for the heat exchanger medium, and a solenoid valve of a fuel feed device, wherein a mounting space is formed directly on the jacket-like outer casing by an integrally cast formation of said outer casing in which printed circuit boards and sensor



elements of said control device are mounted, said sensor elements comprising a temperature sensor for the heat exchange medium and a temperature safety device that are mounted on a bottom wall of the mounting space formed by the jacket-like outer casing.

4,940,042

SYSTEM AND APPARATUS FOR VENTING WATER HEATER

Henry J. Moore, Jr., Playa Del Rey, and Michael K. Garrett, Lakewood, both of Calif., assignors to Mor-Flo Industries, Inc., Cleveland, Ohio

Filed Aug. 24, 1988, Ser. No. 235,973

Int. Cl.[5] F24H *1/00*

U.S. Cl. 126—344 **12 Claims**

1. An indoor domestic type water heater vented directly to outdoor atmosphere under the force of natural convection and comprising:

a generally cylindrical water heater body having a generally flat horizontal top surface, a bottom and a vertical side wall including a combustion chamber having a burner, a combustion air inlet opening and a flue gas outlet opening, and a flue pipe extending vertically from said outlet opening to an open end at the top of said water heater body;

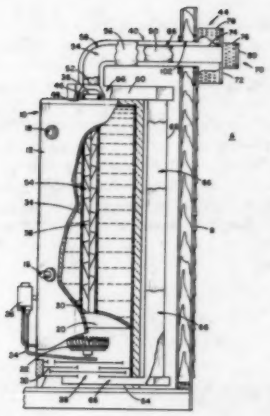
a first conduit assembly extending from said water heater to an outdoor end communicating with outdoor atmosphere, said conduit assembly comprising a first conduit extending from said outdoor end of said conduit assembly to an indoor position adjacent said upper end of said fluid pipe, a closure member defining an airtight convective flow space between said first conduit at said indoor position and said open upper end of said flue pipe, a second conduit received telescopically over said first conduit to define an air flow plenum between said first and second conduits, said second conduit extending from said outdoor end of said conduit assembly to said indoor position of said first conduit;

duct work extending from said second conduit at said indoor position to said combustion air inlet opening, said duct work comprising an upper connecting duct extending horizontally radially outwardly from said air flow plenum at said top of said water heater body to said water heater body side wall, a vertical duct extending downwardly from said upper connecting duct to said water heater body bottom and a lower connecting duct extending from said vertical duct across the bottom of said water heater body to said combustion air inlet opening, said upper connecting duct, said vertical duct and said bottom connecting duct defining an airtight convective flow space communicating said air flow plenum with said combustion chamber; and,

said water heater body further includes air flow baffles within said water heater body adjacent said combustion

air inlet opening and below said burner and above said inlet opening;

said inlet opening being positioned directly below said baffle,



whereby all combustion air must flow through said inlet opening and around said baffle.

4,940,043

CERVICAL COLLAR OF LAMINATE CONSTRUCTION

William R. Burns; Gary R. Burns, and Paul W. Burns, all of East Greenwich, R.I., assignors to Emergency Medical Products, Inc., Warwick, R.I.

Continuation-in-part of Ser. No. 943,655, Dec. 17, 1986, abandoned. This application Apr. 13, 1989, Ser. No. 337,418

Int. Cl.[5] A61F *5/01*

U.S. Cl. 128—75 **1 Claim**

1. A cervical collar comprising:

front and back halves adapted to fit around a person's neck;

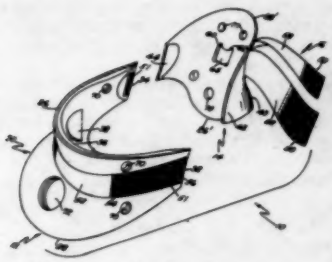
said halves being preformed from a laminated member comprising exterior layers of foamed polymeric material and an interior layer disposed between said exterior layers, said internal layer being of a substantially solid thermoplastic material and being centrally coextensive with the exterior layers to define an un-reinforced periphery;

said front half having a front most portion with a chin receiving depression formed in the top edge thereof, said portion extending generally downwardly and providing a lower edge means for engaging the upper portion of the chest, and end portions extending from said front most portion along both sides of the neck, said end portions tapering in height away from said front portion;

said rear half having a rear most portion curved in the vertical direction to correspond to the shape of the base of the head and neck along the spine, and end portions extending from said rear most portion along both sides of the neck, said end portions tapering in height away from said rear most portion, said rear portion having a pair of parallel slots substantially central of the rear half;

said halves being provided with a plurality of ventilation holes;

said ends of said front half tapering in thickness so as to overlap said ends of said back half to provide continuous encircling support around the neck;



strap means for positioning said halves on the neck and strap securing means being mutually cooperative for releasably securing the ends of said strap means and retaining said halves in a collar configuration;

said strap means including a first strap spanning said front half along its outer perimeter and securely fastened thereto at intermediate points and at said ends by stitching to the front half, and a second strap spanning said back half along its outer perimeter by being looped through parallel slots formed in said rear most portions, said second strap being gripped by said slots.

4,940,044

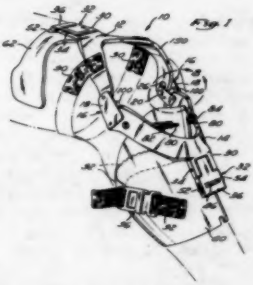
KNEE BRACE INCORPORATING ADJUSTMENT MEANS TO ACCOMMODATE ANATOMICAL VARIATIONS OF THE KNEE JOINT AND LEG

James D. Castillo, Mission Viejo, Calif., assignor to Innovation Sports, Inc., Irvine, Calif.

Filed Feb. 8, 1989, Ser. No. 308,117

Int. Cl.[5] A61F *3/00*

U.S. Cl. 128—80 C **14 Claims**



1. A knee brace comprising:

a pair of frame members sized to be positionable in an inverted relative orientation above and below the knee joint

of a user with the end portions of said frame members disposed laterally on opposite sides of the knee joint and the central portion of said frame members disposed adjacent the front of the user's leg;

a pair of hinge members disposed substantially adjacent the knee joint and connected to the end portions of said frame members to pivot said frame members about the knee joint;

a first and second support member removably attachable to the front of the user's leg above and below the knee joint;

a flapper hinge member mounted to each of said first and second support members engageable with a respective one of said pair of frame members to affix and permit rotational movement of each of said frame members about an axis generally parallel to the pivot axis of said pair of hinge members, said rotational movement allowing said knee brace to accommodate plane variance conditions of the user's leg; and

means formed on said flapper hinge member for varying the lateral position of said first and second support member relative said pair of frame members, said means comprising a carriage slidably positioned on said flapper hinge member and mounted to each of said first and second support members.

4,940,045

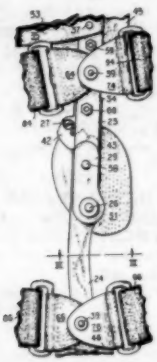
KNEE GUARD AND BRACE WITH ADJUSTABLE MEDIAL CONDYLE SUPPORT PAD

Hendrick L. Cromartie, 2 Ridgewood Rd., Rome, Ga. 30161

Filed Dec. 22, 1988, Ser. No. 288,637

Int. Cl.[5] A61F *5/00*

U.S. Cl. 128—80 C **4 Claims**



1. A knee guard and brace, which comprises:

(a) lateral and medial side members which are adpated to fit on the outer and inner sides, respectively, of a wearer's leg, the lateral side member having first and second ribs and a pair of elongated thigh and calf support pads, the first and second ribs being rigidly connected to the thigh and calf support pads, respectively; the medial side member having third and fourth ribs; an elongated condyle support pad; and means hingedly connected to the third rib for supporting the condyle support pad, the supporting means lacking means for applying a spring-like bias to the condyle support pad, the supporting means including a plate on which the condyle support pad is rigidly mounted;

(b) first means situated generally between the pads for interconnecting the first and second ribs, the first and second ribs and the first interconnecting means forming a lateral bridge over the knee joint;

(c) a thigh cross member which is rigidly connected to the first and third ribs and a calf cross member which is rigidly connected to the second and fourth ribs;

(d) second means situated generally between the thigh and calf cross members for interconnecting the third and fourth ribs, the third and fourth ribs and the second interconnecting means forming a medial bridge over the knee joint;

(e) the thigh cross member and the first and third ribs forming an upper frame and the second and fourth ribs and the calf cross member forming a lower frame, the upper and lower frames preventing the lateral bridge from deforming medially under the impact of a blow;

(f) means for suspending the upper and lower frames along the wearer's leg; and

(g) means mounted on said supporting means for limiting the travel, in a direction toward the second interconnecting means, of an end of the condyle support pad which is distal from points at which said supporting means is hingedly connected to the third rib, the limiting means including means for adjusting the extent to which said end of the condyle support pad can travel in a direction toward the second interconnecting means; the limiting means further comprising means including a spacer rotatable about a pivot on the plate for determining the angle at which the longitudinal centerlines of the condyle support pad and of the third rib can be inclined with respect to each other.

4,940,046

POST-OPERATIVE BUNION SPLINT

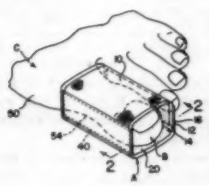
Richard P. Jacoby, 6021 E. Mockingbird La., Paradise Valley, Ariz. 85253

Division of Ser. No. 226,364, Jan. 19, 1981, Pat. No. 4,414,964.

This application Nov. 14, 1983, Ser. No. 551,331

Int. Cl.[5] A61F *5/00, 5/30*; A61B *19/00*

U.S. Cl. 128—81 R **10 Claims**



1. A toe protector device comprising a generally rectangular toe-enclosing pad portion of cushion material having opposite ends for wrapping around the toe of a patient and a generally rectangular-shaped forefoot-engaging pad portion of cushion material for wrapping around the forefoot of the patient, hook-loop separable fastener means on said toe-engaging and forefoot-engaging pad portions for holding them in place wrapped around the toe and forefoot of the patient, and connector means tying said pad portions together in place on the toe and forefoot of the patient; said conector means having a separate tie strap of hooked-type fastener fabric material connectable to said toe-engaging and forefoot-engaging pad portions in a selected tautened position therebetween to locate and hold the toe of the patient in a desired position relative to the forefoot of the patient.

4,940,047

TEXTILE SHEET-LIKE STRUCTURE WITH REACTIVE RESIN

Roland Richter, Cologne; Wolfram Mayer, Odenthal-Glöbusch; Günter Langen, Wolfstein, and Willy Leyser, Bedesbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen and Karl Otto Braun KG, Wolfstein, both of, Fed. Rep. of Germany

Filed Jun. 17, 1988, Ser. No. 208,348

Claims priority, application Fed. Rep. of Germany, Jun. 24, 1987, 3720762; Aug. 7, 1987, 3726268

Int. Cl.[5] A61F *5/04*

U.S. Cl. 128—90 19 Claims

1. Textile sheet-like structure impregnated or coated with water-hardening synthetic resin wherein said impregnated or coated structure is sealed in a film which is impermeable to water, said textile comprising organic fibers with an elasticity modulus of 200 to 2500 daN/mm^2 and having an extensibility in the longitudinal direction of at least 10% before hardening of said resin.

4,940,048

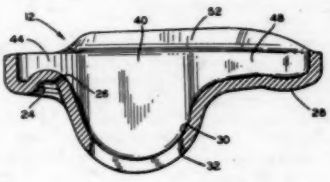
BOAT-TYPE ROCKER ARM WITH FLANGES

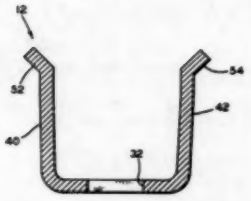
Jesse V. Mills, Toledo, Ohio, assignor to Henley Manufacturing Holding Company, Inc., Hampton, N.H.

Filed Nov. 9, 1989, Ser. No. 434,857

Int. Cl.[5] F01L *1/18*

U.S. Cl. 123—90.39 22 Claims





1. A cold-formed, boat-type rocker arm comprising an elongate, one-piece metal body of generally U-shaped configuration in transverse cross section throughout most of its length, said body having a bottom wall and side walls extending upwardly therefrom and structurally integral therewith, said body having means at a first end portion thereof for receiving a push rod, said body having additional means at a second end portion thereof for receiving an end of a valve stem, said bottom wall having an intermediate opening therein at an intermediate portion of said body to receive pivot means about which said rocker arm can pivot, upper edge portions of said side walls having outwardly-extending, continuous flanges to provide stiffness for said side walls and to resist buckling of said side walls during operation of said rocker arm.

4,940,049

GAS DISPENSING APPARATUS AND CASE THEREFOR

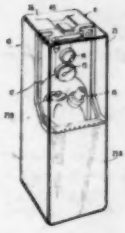
John Kirchgeorg, 1919 N. Summit Ave., Milwaukee, Wis. 53202, and Michael G. Hermann, West Bend, Wis., assignors to John Kirchgeorg, Milwaukee, Wis.

Continuation of Ser. No. 206,448, Jun. 14, 1988, abandoned, which is a division of Ser. No. 862,685, May 13, 1986, Pat. No. 4,788,973. This application Oct. 23, 1989, Ser. No. 425,501

The portion of the term of this patent subsequent to Dec. 6, 2005, has been disclaimed.

Int. Cl.[5] A62B *7/02, 9/04, 25/00, 37/00*

U.S. Cl. 128—205.24 17 Claims



17. An oxygen delivery system, comprising:

(a) a unitary one-piece housing including a bottom, a fixed top wall, and at least one peripheral wall;

(b) an access opening formed in said top wall and in at least a part of said peripheral wall, and comprising an approximate open quarter of said one-piece housing;

(c) oxygen delivery apparatus disposed within said housing, including at least a tank and oxygen conducting means which terminates in a mask;

(d) a cover positionable over said access opening; and

(e) said access opening being sized and said fixed top wall being designed so that said oxygen delivery apparatus may be removed from said unitary one-piece housing by tilting said tank toward said opening and then pulling it out through said opening.

4,940,050

DEVICE FOR ENSURING THE PROPER POSITIONING OF ELECTRODES IN A LITHOTRIPTER

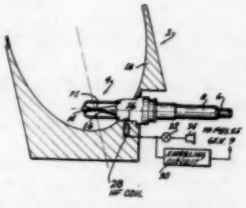
Bernd Forssmann, Germering; Wolfgang Hepp, Immenstaad; Gerold Heine, Uhldingen-Muehlhofen; Gustav Sell, Immenstaad, and Hendrik Zech, Ueberlingen, all of Fed. Rep. of Germany, assignors to Dornier Medizintechnik GmbH, Freidrichshafen, Fed. Rep. of Germany

Continuation of Ser. No. 917,854, Oct. 14, 1986, abandoned. This application Oct. 21, 1988, Ser. No. 262,143

Claims priority, application Fed. Rep. of Germany, Oct. 11, 1985, 3536271

Int. Cl.[5] A61B *17/22*

U.S. Cl. 128—24 A 10 Claims



1. In a lithotripter which includes a device for the generation

and focussing of shock waves for purposes of comminution of concrements, the device including a pair of electrodes positioned in a rotational ellipsoid for focussing generated shock-waves, the ellipsoid having a body, said pair of electrodes extending from a holder, the holder being inserted in said body such that the electrodes center on a first one of the two focal points of the rotational ellipsoid, the improvement comprising,

a positioning device for the electrodes, in the body of rotational ellipsoid and including a position sensing means mounted in the body of the rotational ellipsoid, having a highly accurate and determined position in relation to said first focal point;

a position indicating and establishing means mounted on said electrode holder such that the position indicating and establishing means has a particular, highly accurate and predetermined position in relation to said electrodes; and

circuit means connected to said position sensing means to provide a signal representing an accurate position relation of alignment between the position sensing means and the position establishing means if, and only if, said position indicating and establishing means is in said accurate position relation of alignment with respect to said position sensing means, whereby said electrodes are positioned on said first focal point.

4,940,051

INHALATION DEVICE

Tapio Laakinen, Turku, Finland, assignor to Huhtamki Oy, Turku, Finland

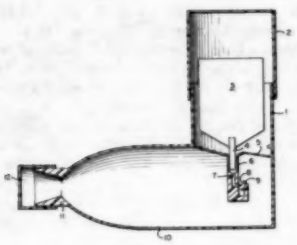
PCT No. PCT/FI84/00100, § 371 Date Aug. 26, 1985, § 102(e) Date Aug. 26, 1985, PCT Pub. No. WO85/02778, PCT Pub. Date Jul. 4, 1985

PCT Filed Dec. 21, 1984, Ser. No. 777,085

Claims priority, application Finland, Dec. 28, 1983, 834816

Int. Cl.[5] A61M *11/00*

U.S. Cl. 128—200.18 **13 Claims**



1. An inhalation device which comprises a tubular body defining an inhalation chamber, said tubular body having a sidewall, an endwall disposed at one end of said tubular body and a mouthpiece at the opposing end of said body, said sidewall having mounting means for mounting a container of medicament and conduit means for providing a medicament passageway from said mounting means to said inhalation chamber and for discharging medicament into said chamber in a direction toward said endwall, said device including means for deflecting medicament discharged by said conduit means in a direction towards said mouthpiece, and valve means for introducing air into said chamber during inhalation.

4,940,052

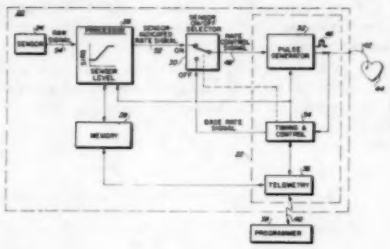
MICROPROCESSOR CONTROLLED RATE-RESPONSIVE PACEMAKER HAVING AUTOMATIC RATE RESPONSE THRESHOLD ADJUSTMENT

Brian M. Mann, Los Angeles, and John W. Poore, South Pasadena, both of Calif., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 25, 1989, Ser. No. 301,934

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **47 Claims**



1. A rate-responsive pacemaker comprising:

pulse generator means for generating pacing pulses at a rate set by a rate control signal;

means for generating a base rate signal;

sensor means for generating a raw sensor signal having a value that varies as a function of a sensed physiological parameter;

processor means for generating a pacing rate signal as a function of said raw sensor signal, wherein said processor means comprises:

preprocessing means for generating one of a plurality of sensor level index signals as a function of the value of said raw sensor signal, said plurality of sensor level index signals including a minimum sensor level index signal corresponding to all values of said raw sensor signal below a first prescribed threshold, and a maximum sensor level index signal corresponding to all values of said raw sensor signal above a second prescribed threshold; and

conversion means for converting said one of a plurality of sensor level index signals to said pacing rate signal;

and

selection means for selecting one of said base rate signal or said pacing rate signal as the rate control signal for said pulse generator means, whereby said pulse generator means generates said pacing pulses at a rate determined by the selected one of said base rate signal or said pacing rate signal.

4,940,053

ENERGY CONTROLLED RATE-RESPONSIVE PACEMAKER HAVING AUTOMATICALLY ADJUSTABLE CONTROL PARAMETERS

Brian M. Mann, Los Angeles, and John W. Poore, South Pasadena, both of Calif., assignors to Siemens-Pacesetter, Inc., Sylmar, Calif.

Filed Jan. 25, 1989, Ser. No. 301,935

Int. Cl.[5] A61N *1/00*

U.S. Cl. 128—419 PG **23 Claims**

1. A rate-responsive pacemaker comprising:

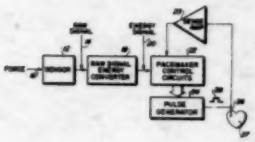
pulse generating means for generating stimulating pulses:

control means for controlling the rate at which said pulse generating means generates said stimulating pulses;

sensor means for sensing a physiological parameter and for generating an electrical signal representative of said sensed physiological parameter; and

signal processing means for processing said electrical signal and for generating a control signal representative of the energy content of said electrical signal, said control signal being applied to said control means, and said control means being responsive at least in part to said control signal in controlling the rate at which said stimulating pulses are generated, wherein said signal processing means comprises:

rectifying amplifier means for amplifying and rectifying said electrical signal;



voltage controlled oscillator means coupled to the output of said rectifying amplifier means for generating an oscillator signal having a frequency that varies as a function of the signal output from said rectifying amplifier means; and

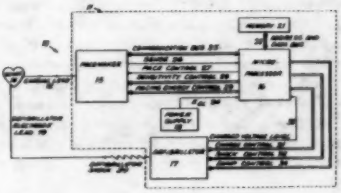
measurement means for measuring the frequency of said oscillator signal over a prescribed time interval, said frequency measurement comprising said control signal.

4,940,054

APPARATUS AND METHOD FOR CONTROLLING MULTIPLE SENSITIVITIES IN ARRHYTHMIA CONTROL SYSTEM INCLUDING POST THERAPY PACKING DELAY

Richard Grevis, Rose Bay, Australia, and Norma L. Gilli, Littletown, Colo., assignors to Telectronics N.V., Curacao, Netherlands Antilles

Filed Apr. 29, 1988, Ser. No. 187,797
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—419 PG **39 Claims**



1. An apparatus for administering electrotherapy to the heart comprising:

a detector responsive to an electrical signal from the heart, said detector providing an output signal in response to said electrical signal;

sensitivity control means connected to said detector for controlling the sensitivity of said detector to said electrical signal, said sensitivity control means controlling said sensitivity to a first sensitivity level at a first time;

tachyarrhythmia detection means for receiving said output signal from said detector set at said first sensitivity level to determine if a tachyarrhythmia is sensed at said first time;

tachyarrhythmia confirmation means for receiving said output signal from said detector set at said first sensitivity level to confirm the presence of said tachyarrhythmia at a second time after said first time;

tachyarrhythmia therapy means for delivering tachyarrhythmia therapy to the heart if said tachyarrhythmia confirmation means confirms the presence of tachyarrhythmia at said second time;

said sensitivity control means controlling said sensitivity of said detector to a second sensitivity level if a tachyarrhythmia is not sensed by said detector at said second time, said second sensitivity level being higher than said first sensitivity level; and

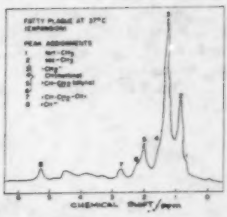
said tachyarrhythmia therapy means delivering tachyarrhythmia therapy if said detector, at said second sensitivity level, detects tachyarrhythmia.

4,940,055

HIGH-RESOLUTION SPECTRAL SIGNATURE OF HUMAN ARTERIAL PLAQUE

Michael F. Brown, Charlottesville, Va., assignor to University of Virginia Alumni Patents Foundation, Charlottesville, Va.

Filed Nov. 3, 1987, Ser. No. 106,669
Int. Cl.[5] A61B *5/055*
U.S. Cl. 128—653 A **7 Claims**



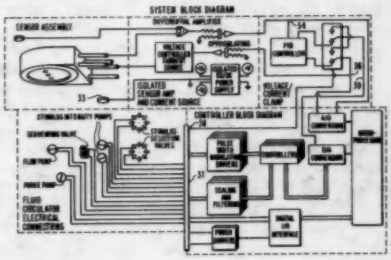
1. The noninvasive method of identifying and quantifying constituents of arterial plaque comprising subjecting arterial walls to localized proton NMR spectroscopy, obtaining a proton NMR spectra and evaluating the proton NMR spectra exclusive of water for sharp spectral lines indicative accumulation of lipids in walls of human arterial blood vessels and detecting early changes to arterial walls due to atherogenesis.

4,940,056

ELECTROGUSTOGRAPH

Gerard L. Heck, and John A. DeSimone, both of Richmond, Va., assignors to Center for Innovative Technology, Herndon, Va.

Filed Nov. 15, 1988, Ser. No. 271,317
Int. Cl.[5] A61B *5/04*
U.S. Cl. 128—639 **15 Claims**



1. A sensor for measuring a physiological response by attachment to the flexible surface of a living animal comprising:

a housing having an outer wall with a first side for attachment to said flexible surface;

an outer ring on said first side;

an inner ring on said first side concentric with said outer ring and defining an annular recessed space between said rings;

a fluid receiving recess on said first side within the boundary of said inner ring;

a fluid inlet on said housing having a passageway connecting said inlet to said fluid receiving recess for receiving a fluid;

a fluid outlet on said housing having a passageway connecting said outlet to said fluid receiving recess; and

a vacuum inlet on said housing connected to said recessed annular space.

4,940,057

APPARATUS FOR MEASURING BRAIN FUNCTION USING NUCLEAR MAGNETIC RESONANCE

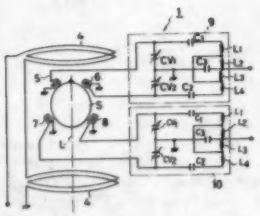
Hirotake Kamei, Ibaraki, Japan, assignor to Agency of Industrial Science & Technology, Ministry of Industrial Trade & Industry, Tokyo, Japan

Filed Jul. 15, 1987, Ser. No. 73,718

Claims priority, application Japan, Jul. 15, 1986, 61-166115

Int. Cl.[5] A61B 5/05

U.S. Cl. 128—653 A 3 Claims



1. A brain function measuring apparatus employing nuclear magnetic resonance, comprising:

means for uniformly applying a static magnetic field to a subject so that the head of the subject is located at the center of the static magnetic field;

rotational magnetic field exciting means set in place about the head of subject for producing magnetization vectors perpendicular to the static magnetic field;

a plurality of signal detection coil means arranged about the head of the subject and each of said signal detection coil means comprising two coils arranged in symmetrical opposition to the left and right of a median line of the head of the subject and connected so that two nuclear magnetic resonance signals are produced wherein said two nuclear magnetic resonance signals are in phase opposition;

a plurality of balanced detector means each connected to one of said plurality of detection coil means for comparing said two resonance signals and detecting a differential component of said two resonance signals;

processing means for effecting Fourier transformation of the differential component into positional information and detecting the location of the site of brain activity from said positional information; and

display recorder means for three-dimensionally displaying the detected location of the site of brain activity.

4,940,058

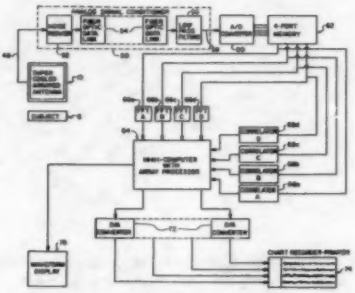
CRYOGENIC REMOTE SENSING PHYSIOGRAPH

Barry E. Taff, 8665 Pickford St. #8, Los Angeles, Calif. 90035, and Kenneth P. Stoller, 1319 Stratford Ave., South Pasadena, Calif. 91030

Continuation-in-part of Ser. No. 871,925, Jun. 9, 1986, abandoned. This application Jun. 10, 1988, Ser. No. 205,085

Int. Cl.[5] A61B 5/00

U.S. Cl. 128—653 R 9 Claims



1. Apparatus for remotely monitoring the internal physiological processes of a human subject by measuring the electromagnetic signals emanating from the body of said subject and separating said signals into EKG, EEG, EMG, EOG and respiration waveform representing said physiological processes, comprising:

(a) an arrayed antenna adapted to be located in a spaced remote relationship of up to about 12 feet from the body of a human subject, the arrayed antenna including three like supercooled super-conducting metallic antenna plates for detecting electromagnetic signals in the 0.3 to 40 Hertz frequency range emanating from the physiological processes of said subject, said the arrayed antenna having three like supercooled analog circuitry packages each interconnected to one of said metallic plates for outputting said electromagnetic signals;

(b) an analog signal conductor having an input stage coupled to the analog circuitry packages of the arrayed antenna and including means adapted to receive and improve the signal-to-noise ratio of the detected electromagnetic signals and said signal conditioner having an output stage including a low-pass filter for filtering out signal frequencies of over 40 Hertz from said electromagnetic signals;

(c) an analog-to-digital converter coupled to the output stage of the analog signal conditioner to receive and convert the 0.3 to 40 Hertz electromagnetic signals to digital signals;

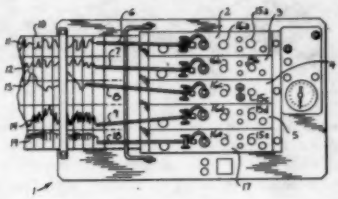
(d) a digital signal processor means coupled to the analog-to-digital converter to receive and separate said digital signals into component waveforms representing the internal physiological processes of said human subject, said digital signal processor means comprising a minicomputer including 4-port memory with serial in-time sequence overlapping memory windows and dedicated outboard Fast Fourier Transform and autocorrelator microprocessors coupled to said minicomputer with signal discriminating software for directing the separation of said digital signals by said minicomputer into component waveforms representing the physiological processes of said subject; and

(e) means coupled to said digital signal processor means for displaying and permanently recording said component waveforms.

4,940,059
POLYGRAPH WITH IMPROVED CARDIAC MONITORING

Michael H. Voelz, Battle Ground, Ind., assignor to Lafayette Instrument Co., Inc., Lafayette, Ind.

Filed Mar. 21, 1988, Ser. No. 170,743
Int. Cl.[5] A61N *1/00*
U.S. Cl. 128—688 **10 Claims**



1. A polygraph for detecting and recording physiological changes in an individual, comprising:

sensing means for sensing a physiological condition of an individual, said physiological condition representable by a periodic cyclic waveform having a leading upstroke portion and a trailing downstroke portion;

control means operatively connected to said sensing means for determining a rate of change over time of the upstroke portion of the waveform for said physiological condition; and

display means operatively connected to said control means for displaying a signal indicative of said rate of change over time, wherein said sensing means produces a source voltage signal indicative of said condition, said display means includes a housing, a record chart on said housing, a pen engageable with said record chart, means for mounting said pen on said housing, and means for driving said pen on said chart, and said control means includes a control circuit operably connected to said pen driving means and responsive to the source voltage signal from said sensing means to provide a driving signal to said pen driving means, said control circuit includes differentiator means for detecting a change in the source voltage signal and for producing a differential signal having a waveform indicative of the source voltage signal change, said control circuit further includes measuring means for measuring a parameter which is characteristic of said differential signal waveform over a given time interval and for providing said driving signal, said time interval occurs at regularly spaced time periods, and said measuring means includes timing means for determining said time interval, wherein said time interval is periodic, and wherein said measuring means includes peak detector means for detecting a peak differential signal, and a sample and hold circuit means operable between a sample mode for receiving said peak differential signal and a hold mode for holding said peak differential signal.

4,940,060
APPARATUS FOR DETECTING BIOELECTRIC SIGNALS

Hansen Gu, and Dumin Wu, both of Building 18, HongXu Road, Shanghai, China

Filed Sep. 9, 1987, Ser. No. 94,621
Claims priority, application China, Sep. 9, 1986, 86105980
Int. Cl.[5] A61H *39/02*
U.S. Cl. 128—735 **18 Claims**

1. An apparatus for stimulating and detecting bioelectric signals, comprising:

a detecting electrode, adapted to detect electrical signals when in contact with the skin of a patient at chosen acupoints on the body of the patient;

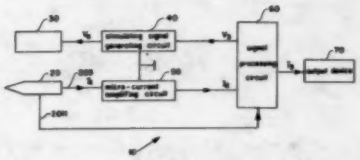
a reference electrode adapted to be held against the skin of a patient and the couple stimulating signals into the skin of the patient at a fixed reference point on the center line of the patient;

an amplifying circuit means connected to said detecting electrode for amplifying micro-current signals in the range of 10^{-11} and 10^{-4} amperes detected thereby:

a stimulating signal generating circuit means connected to said reference electrode for applying a stimulating voltage to the skin of the patient at said fixed reference point on the center line of the body of the patient;

wherein said detecting electrode, reference electrode, amplifying circuit means, and stimulating signal generating circuit means form a stimulating and detecting circuit means for stimulating and detecting bioelectric signals;

the apparatus further comprising a signal processing circuit means connected to the output of said amplifying circuit means for processing the output signals; and



output means connected to the output of said signal processing circuit means for displaying the processed output signals;

wherein said amplifying circuit means comprises:

a logarithmic micro-current amplifier;

a temperature compensating circuit; and

an inverting circuit;

wherein said logarithmic micro-current amplifier has an input connected to said detecting electrode, and an output connected to an input of said temperature compensating circuit which has an output connected in turn to the input of said inverted circuit, and the output of the inverting circuit is provided to the input of said signal processing circuit means, whereby a detected micro-current in the range of 10^{-11}–10^{-4} amperes is amplified to provide an output signal proportional to the negative logarithm of said micro-current.

4,940,061
BIOPSY INSTRUMENT

Richard A. Terwilliger, Alamo; Daniell Hebert, San Francisco, and Jack Hall, Portola Valley, all of Calif., assignors to Ingress Technologies, Inc., Phoenix, Ariz.

Filed Nov. 27, 1989, Ser. No. 441,776
Int. Cl.[5] A61B *10/00*
U.S. Cl. 128—754 **20 Claims**

1. A motor powered instrument for removing a tissue sample from a tissue mass comprising a housing, a tissue penetrating means and severing means disposed at one end of said housing, operating means positioned in said housing and operably connected to said tissue penetrating means and severing means for causing relative linear movement of said tissue penetrating means and said severing means in a sequential manner whereby said tissue penetrating means proceeds by linear movement from a retracted to an extended position followed by linear

movement of said tissue severing means from a retracted to an extended position to effect a severing of a portion of said tissue mass, said operating means including motor means and means to convert rotary motion to sequential, reciprocating linear motion of substantially constant force and velocity to said tissue penetrating means and severing means.

4,940,062

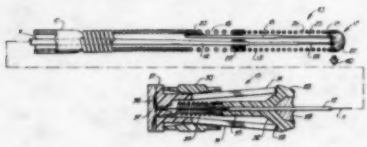
GUIDING MEMBER WITH DEFLECTABLE TIP

Hilary J. Hampton, Santa Clara; John W. Gaiser, Mountain View; Charles S. Taylor, San Francisco, and Timothy R. Machold, Moss Beach, all of Calif., assignors to Advanced Cardiovascular Systems, Inc., Santa Clara, Calif.

Filed May 26, 1988, Ser. No. 199,099

Int. Cl.[5] A61M *25/00*

U.S. Cl. 128—772 **26 Claims**



1. A guide member for vascular catheters having a deflectable distal tip comprising:

a. an elongated tubular member having a distal end;

b. an elongated core element disposed within the tubular member and having a tapered distal portion which extends out the distal end of the tubular member;

c. disposed about the tapered distal portion of the core element which extends out of the distal end of the tubular member, a helical coil element which has a proximal and distal ends, which has an expanded coil section at a location proximal to and spaced from the distal end of the coil element, which is secured to the core element at a location distal to the expanded coil section and proximal to the distal end of the coil and which has a rounded plug at the distal end thereof;

d. an elongated reference element which is secured to an adjacent side of the helical coil element at a first location proximal to the expanded coil section and at a second location distal to the location where the coil section element is secured to the core element;

e. means to provide columnar support to the proximal end for the coil; and

f. means to axially move the core element with respect to the coil element along the longitudinal axis thereof, such longitudinal movement causing the expanded coil section to change the spacing between the turns thereof along the side of the coil opposite to the side adjacent to the reference element resulting in the deflection of the distal tip of the guide member.

4,940,063

ANGULAR DISPLACEMENT MEASURING APPARATUS

Brian Challis, No. 9 Northridge Way, Sandy, Utah 84092

Filed Feb. 23, 1989, Ser. No. 314,441

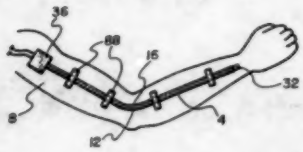
Int. Cl.[5] A61B *5/10*

U.S. Cl. 128—774 **14 Claims**

1. An angular displacement measuring device comprising

a bendable conduit having a side wall which is stretchable in the direction parallel to the longitudinal axis of the conduit but is substantially noncompressible in the same direction so that when the conduit is bent, the portion of the side wall on the outside of the bend elongates while the portion of the side wall on the inside of the bend remains substantially unshortened,

a fiber having first and second ends disposed in the conduit so that the first end extends from one end thereof, where the fiber is fixed at the second end of said conduit so that it may not slide longitudinally relative to and out of the other end of the conduit and where the remainder of the fiber is free to slide relative to the remainder of the conduit, and



movement measuring means disposed at said other end of the conduit and coupled to said fiber for measuring movement of the fiber relative to the conduit as the conduit is bent to thereby measure the angle of bending of the conduit.

4,940,064

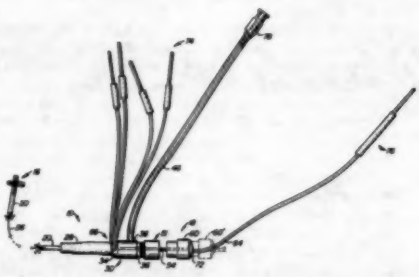
CATHETER FOR MAPPING AND ABLATION AND METHOD THEREFOR

Jawahar M. Desai, 2721 W. Browning, Fresno, Calif. 93711

Continuation-in-part of Ser. No. 931,696, Nov. 14, 1986, abandoned. This application Jun. 30, 1987, Ser. No. 68,833

Int. Cl.[5] A61N *1/04*

U.S. Cl. 128—784 **7 Claims**



1. A percutaneous endocardial lead comprising:

an elongated body member having an elongated hollow core therewithin, a proximal end portion, and a distal end portion;

an elongated shaft member slidingly mounted within said elongated hollow core of the body member, said elongated shaft member having a proximal end portion and a distal end portion, and said shaft member distal end portion being operatively connected to said distal end portion of the elongated body member;

a tip electrode at said distal end portion of the elongated shaft member and in electrical communication with said proximal end portion of the elongated body member;

a plurality of elongated peripheral segments at the distal end portion of the elongated body member;

a plurality of elongated conductors, each extending between each of said elongated peripheral segments and said proximal end portion of the elongated body member, said elongated conductors being insulated from each other;

mapping electrode means including a plurality of electrodes, each said electrode being on each said elongated peripheral segment, each said electrode being in electrical communication with one of said elongated conductors, and said electrodes of the mapping electrode means provide an electrode array generally around the tip electrode;

means for adjusting said electrode array between a closed configuration that is substantially isodiametric with said

elongated body member and open configurations at which each elongated peripheral segment folds on itself and moves each electrode to an outwardly directed location including to a location generally coplanar with said tip electrode;

said means for adjusting said electrode array including said elongated body member and said elongated shaft member slidingly mounted therewithin, whereby said elongated body member and said elongated shaft slidingly move relative to each other in order to adjust said electrode array between said closed configuration and said open configurations; and

ablation means having an ablation surface generally at said tip electrode, said ablation surface being generally circumscribed by said electrode array at said open configurations thereof.

4,940,065

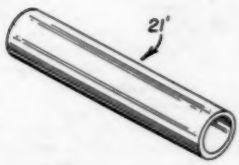
SURGICALLY IMPLANTABLE PERIPHERAL NERVE ELECTRODE

Emil A. Tanagho; Richard A. Schmidt, San Rafael; Curtis A. Gleason, Palo Alto, and Tom F. Lue, Millbrae, all of Calif., assignors to Regents of the Univ. of Calif., Berkeley, Calif.

Filed Jan. 23, 1989, Ser. No. 299,135

Int. Cl.[5] A61N *1/05*

U.S. Cl. 128—784 **15 Claims**



1. A peripheral nerve electrode adapted to be surgically implanted around a nerve comprising

carrier means formable about a longitudinal wrapping axis thereof from an opened position to a closed position encircling a nerve, said carrier means composed of a biocompatible and dielectric material and when in its opened position said carrier means having a main body portion extending in the direction of said axis and flap portions extending transversely outwardly from opposite ends of said main body portion and from said axis and when in its closed position said carrier means having opposed edges of opposite sides of its main body and flap portions disposed in close abutting relationship relative to each other to form a tube, and

electrode means secured on an inner surface of said carrier means for selectively electrically stimulating said nerve when said carrier means is in its closed position thereabout.

4,940,066

TIBIA RETRACTOR

Albert N. Santilli, 2832 Gates Mills Blvd., Cleveland, Ohio 44124, and Kenneth M. Kuzmick, 5601 Corporate Way, W. Palm Beach, Fla. 33407

Filed Nov. 17, 1988, Ser. No. 273,384

Int. Cl.[5] A61F *5/40*

U.S. Cl. 128—882 **17 Claims**

1. A tibia retractor, comprising:

a flexible planar member having first and second opposed sides disposed generally parallel to each other and first and second ends disposed generally parallel to each other, the first and second sides being foldable toward each other to form a receptacle into which one's foot can be placed, the first end of the planar member defining a first portion of the receptacle adapted to receive the foot, and the second end of the planar member defining a second portion of the receptacle;

means included as part of the receptacle for attaining a tight-fitting relationship between the foot and the receptacle;

an extensible strap means having first and second ends, the strap means being connected at its first end to the first portion of the receptacle and being connectable at its second end to the first portion of the receptacle, the first

and second ends of the strap being connected to opposite sides of the first portion, the strap means for passing over the femur when the second end of the strap means is connected to the first portion of the receptacle and one's foot is disposed within the receptacle; and

connecting means for releasably connecting the second end of the strap means to the first portion of the receptacle, the connecting means permitting the strap means to be securely connected to the receptacle in a variety of lengths, whereby the effective length of the strap means can be adjusted.

4,940,067

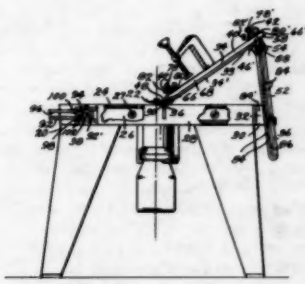
JOINING APPARATUS FOR CUTTING WORK PIECES

Paul R. Beard, 6409 Renaldo Way S., St. Petersburg, Fla. 33707

Filed Dec. 6, 1989, Ser. No. 446,800

Int. Cl.[5] B27F *5/00, 1/06*

U.S. Cl. 144—2 R **20 Claims**



1. Apparatus for cutting work pieces, said apparatus comprising:

a first support;

a cutting element attached to said support and projecting upwardly above said support;

first and second guide elements attached to said support and in substantially parallel relationship with each other;

a first slide element removably and slideably mounted on said first guide element;

a second slide element removably and slideably mounted on said second guide element;

a connecting element defining opposed ends and extending between and attached to said slide elements;

a work piece support having a work piece support surface;

means in operative relationship with said work piece support

surface and said slide elements for enabling the adjustable positioning of said work piece support surface with respect to said first support and with respect to said cutting element; and

means in operative relationship with said first guide element and with said first slide element for adjustably limiting movement of said first slide element on said first guide element.

4,940,068

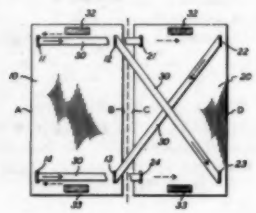
FOLDING CONTAINER

Herta M. Pokorny, 358 Castle Rd., Rochester, N.Y. 14623, and Stefania Pokorny, 28 Barton Street, Rochester, N.Y. 14611

Filed May 22, 1989, Ser. No. 355,297

Int. Cl.[5] A45C *1/06*

U.S. Cl. 150—132 3 Claims



1. A folder, including:

front and back rectangular covers, each having parallel top and bottom end edges and parallel inner and outer side edges, with an imaginary fold line between a side edge of said front cover and the adjacent side edge of said back cover;

said covers including inner apertures near the inner corners thereof and outer apertures near the outer corners thereof;

an elastic tie band connecting said front and back covers by interlacing sequentially through said apertures as follows:

a. from an outer aperture of said front cover,

b. to an inner aperture of said back cover,

c. to an outer aperture of said back cover,

d. to an inner aperture of said front cover,

e. to an outer aperture of said front cover,

f. to an inner aperture of said back cover,

g. to an outer aperture of said back cover, and

h. to an inner aperture of said front cover;

whereby, said elastic tie band overlies said covers to hold their contents in place and to facilitate insertion and removal of contents into and out of said folder, and said folder opens by rotation of one cover relative to the other on an imaginary fold line in either direction;

said covers further including mating top fastening strips positioned adjacent to and parallel with said top end edges and adapted to fasten to each other, and mating bottom fastening strips positioned adjacent to and parallel with said bottom end edges and adapted to fasten to each other said fastening strips effective to prevent slippage of contents from the top and bottom ends of said folder and to secure said folder when closed.

4,940,069

RUN-FLAT TIRE AND RIM ASSEMBLY FOR ATV

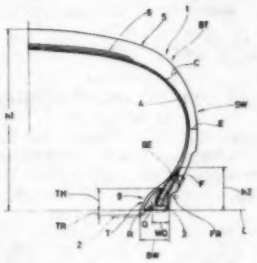
Eiji Nakaski, Kakogawa, and Yasuo Igarashi, Kawanishi, both of Japan, assignors to Sumitomo Rubber Industries, Ltd., Hyogo, Japan

Filed Nov. 30, 1988, Ser. No. 277,705

Claims priority, application Japan, Nov. 30, 1987, 62-304070

Int. Cl.[5] B60C *15/024*

U.S. Cl. 152—544 14 Claims



1. An assembly of a run-flat tire and a rim for all-terrain vehicles, said tire comprising;

a pair of beads having substantial inextensible bead cores;

a toroidal carcass comprised of ply cords and having a radial construction, said carcass extending across the beads and being turned up at both edge portions around said bead cores;

a tread disposed radially outward of said carcass;

a pair of sidewalls disposed on the outside of said carcass, each of said sidewalls extendng from an end of the tread to the bead of the tire, the rubber thickness of each sidewall being at least 10 times the diameter of the ply cords of said carcass;

a pair of bead apexes each disposed radially outside each of said bead cores so as to extend radially outwardly from said bead cores, a radially outward height of the radially outermost end of said bead cores from a heel point of the bead being within a range of 20 to 40% of the section height of the tire; and

said beads each having a bead toe disposed axially inward of said bead cores, said bead toe having a protrusion protruding radially inwardly from a bead base defined as a radial inward surface of the bead under the bead core, and each bead being provided with a hump groove between the bead base and the protrusion, said rim having:

a well in the center portion of the rim;

a pair of bead seats one on each side of side well;

a pair of humps each formed axially inward and adjacent to each bead seat to be engaged with said hump grooves of the tire beads; and

a pair of groove each formed axially inward of each hump to receive said protrusions of the tire bead toes

said bead toe comprising a toe strip made of a hard rubber compound having a JIS A hardness of 65 to 95 degrees, and a height of the toe strip from the bead base being in a range of 120 150% of the height of a flange of the rim from the bead base; and

said bead having a width in an axial direction being in a range of 2.4 to 2.7 times the width of the bead seat.

4,940,070

BIFOLD PRIVACY MINIBLIND

Scott L. Warden, 1742 S. Louisville, Tulsa, Okla. 74112

Continuation-in-part of Ser. No. 174,984, Mar. 29, 1988, abandoned. This application Mar. 10, 1989, Ser. No. 321,726

Int. Cl.[5] E06B 9/26

U.S. Cl. 160—176.1 **4 Claims**

1. A window blind comprising:

a top member;

a plurality of horizontal slats;

at least two ladder support systems supporting said slats and in which each system has a front ladder string exterior of said slats, a back ladder string and a plurality of slat support strings connecting the two ladder strings at spaced positions therealong;

a mechanism supported by said top member and operable by rotating the stem for adjusting the front ladder string with respect to the back ladder string so as to adjust the inclination of each slat;

each said slat having a hole therein adjacent said each said slat support string;

a drawstring support and locking mechanism supported by the top member;

a main drawstring and pull knob for lifting the slats and extending through the holes thereof;

a guide in the top member and having a passage means therethrough for the main drawstring and for each said front ladder string and for each said back ladder string;

the path of said main drawstring extending from adjacent one end of said slats upwardly through said drawstring support and locking mechanism, along said top member, down said passage means, through the holes in said slats and secured at the lower end of said window blind;

at least one privacy drawstring having a first end and a second end, the path of said privacy drawstring beginning at or near the first end of said main drawstring following upwardly along said main drawstring through said support and locking mechanism, then along said top member adjacent said main drawstring, thence down the opening means in said top along side and adjacent one of said ladder strings down to a selected located on such ladder string, the privacy drawstring passing over no pulley or support not passed over by said main drawstring;

means to attach the second end of said privacy drawstring to a ladder string at said selected location;

a privacy pull knob means slidably interconnected to said main drawstring, and said privacy pull knob means connected to said first end of said privacy drawstring.

4,940,071

METHOD AND DEVICE FOR FABRICATING MOULDS FROM GRANULAR MATERIAL

Jean-Jacques Mazeran, F-51000, Chalon sur Marne, France

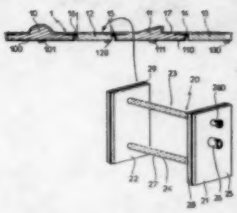
PCT No. PCT/FR88/00377, § 371 Date Mar. 6, 1989, § 102(e) Date Mar. 6, 1989, PCT Pub. No. WO89/00467, PCT Pub. Date Jan. 26, 1989

PCT Filed Jul. 20, 1988, Ser. No. 350,734

Claims priority, application France, Jul. 22, 1987, 87 10514

Int. Cl.[5] B22C 9/02, 21/02

U.S. Cl. 164—7.2 **14 Claims**



1. A device for making a foundry mould comprising:

a support having first and second side, model plates and a bottom, sealing plate;

an armature defining first and second longitudinal end walls of said support, so that said support and said armature together define a mould cavity;

at least one polymer envelope element disposed within said mould cavity;

means for feeding a granular material for forming a foundry mould into said mould cavity; and

means for generating a vacuum within said mould cavity.

9. A method of making a foundry mould comprising:

provided a support including first and second side, model plates and a bottom, sealing plate;

installing on said side and bottom plates at least one polymer envelope by thermoforming by suction through said plates;

providing an armature including first and second end plates;

mounting said side and bottom plates in surrounding relation to said end plates of said armature so as to define a mould cavity having side walls, end walls and a bottom wall, said polymer envelope being clamped between the end plates of the armature and the side and bottom plate;

filling the mould cavity with granular material for forming said foundry mould, compacting said granular material and leveling the same;

sealing said mould cavity;

placing the volume contained in the polymer envelope within the mould cavity under vacuum; and

removing said plates.

4,940,072

REMOVING PATTERN MATERIAL FROM INVESTMENT CASTING MOLDS

Mark A. Pellman, Orefield; Paul T. Kilhefner, III, Wescosville, and Terrence S. Hahn, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.

Filed May 31, 1989, Ser. No. 359,244

Int. Cl.[5] B22C 9/04

U.S. Cl. 164—35 **10 Claims**

1. A method of removing a relatively lower melting point pattern material from a relatively higher temperature stable investment casting mold comprising; heating said mold containing said pattern material in the vapor phase of a fluorochemical having a boiling point above the melting point of said pattern material to condense said vapor on said pattern material and transfer the latent heat of vaporization of said fluorochemical to said pattern material, melting the pattern material

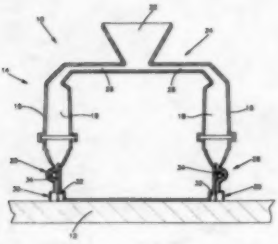
for facilitating removal from said mold, and removing the melted pattern material from said mold.

4,940,073

MOLD FOR CASTING A SINGLE CRYSTAL METAL ARTICLE

Arunachalam Jeyarajan, Euclid; Lawrence D. Graham, Chagrin Falls; John E. Brokloff, North Canton, and Louis H. Monte, Minerva, all of Ohio, assignors to PCC Airfoils, Inc., Cleveland, Ohio

Filed Jul. 19, 1989, Ser. No. 382,729
Int. Cl.[5] B22C *9/04*
U.S. Cl. 164—361 11 Claims



1. A mold for use in casting a single crystal metal article, said mold comprising article mold means for defining an article mold cavity having a configuration corresponding to the configuration of the article to be cast, starter means for defining a starter cavity in which molten metal solidifies as a plurality of upwardly extending elongated metal crystals, and selector means extending between an upper end portion of said starter means and a lower end portion of said article mold means for at least partially defining a crystal selector passage which extends between said starter cavity and said article mold cavity and from which a single crystal of metal solidifies upwardly into said article mold cavity, said selector means including a lower section connected with said starter means and in which a linear lower vertical portion of said selector passage extends upwardly away from an upper end portion of said starter cavity, an upper section connected with said article mold means and in which a linear upper vertical portion of said selector passage extends downwardly away from a lower end portion of said article mold cavity, a single bend section connected with said upper and lower sections and in which a single bend portion of said selector passage extends between an upper end of the lower portion of said selector passage and a lower end of the, upper portion of said selector passage, and a support element which extends upwardly from said lower section to said upper section of said selector means to at least partially support said bend section of said selector means, said single bend portion of said selector passage having a single arcuate bend and a longitudinal central axis which intersects coincident vertical central axes of said upper and lower portions of said selector passage, said longitudinal central axis of said single bend portion of said selector passage and the vertical central axes of said upper and lower portions of said selector passage being disposed in a single flat plane.

4,940,074

CORE PINNING MACHINE

Alan W. Menard, Bolton, Conn., assignor to United Technologies Corporation, Hartford, Conn.

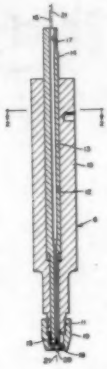
Filed Jun. 30, 1986, Ser. No. 880,602
Int. Cl.[5] B22C *19/00*; B23D *23/00*
U.S. Cl. 164—412 9 Claims

2. A core pinning machine adapted for inserting a core supporting wire pin of variable length into a wax pattern, said machine characterized by:

means for providing and feeding a continuous length of wire;

means for heating the wire prior to insertion into said wax pattern; and,

means for cutting the wire, said cutting means including a housing, a cylinderical shank disposed within said housing and rotatable therein, said shank including a central longitudinal axis and a cutting end, said shank further including a wire guide passage longitudinally extending therethrough, parallel to and offset from said central longitudinal shank axis, a cutter, abutted to the cutting end of said shank, said cutter having a sharp edged orifice, and, means for rotating said shank within said housing such that said passage is rotatable into alignment with said orifice, such that a wire is passable therethrough, wherein rotating said shank totally misaligns said passage with said orifice, severing said wire therein.

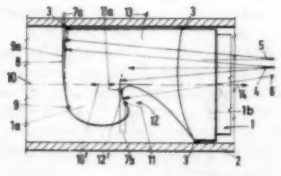


4,940,075

START-UP HEAD FOR HORIZONTALLY CONTINUOUS CASTING

Achim Kubon, Neukirchen-Vluyn, and Klaus-Peter Ehlert, Moers-Repelen, both of Fed. Rep. of Germany, assignors to Mannesmann AG, Duesseldorf, Fed. Rep. of Germany

Filed Mar. 24, 1989, Ser. No. 328,175
Claims priority, application Fed. Rep. of Germany, Mar. 24, 1988, 3810304
Int. Cl.[5] B22D *11/08*
U.S. Cl. 164—446 1 Claim



1. Start-up head for continuous casting in a horizontal direction, the head having a coupling member that will be embedded from three sides in molten metal which forms a casting the coupling member having a hooklike portion, the improvement comprising

the hooklike portion having an undercut portion below the center line of the head and having a point of curvature

inflection, the undercut portion running from that point of inflection towards said center line along a circular path having a first center (6) of curvature above a horizontal plane that runs through the center line;

a front end of the hookline portion has a circular contour beginning from a point below the center line at a distance that is about the same distance the point of inflection has from the center line, the circular contour extending to the upper side of the member has also a second center (5) of curvature above said first center of curvature but at a larger distance from the center line; and

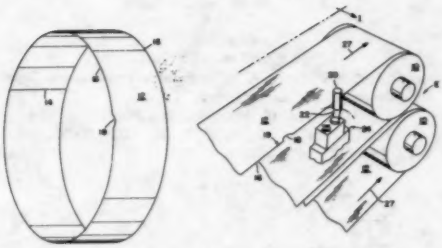
a center for uncoupling the member from the casting being situated between said first (6) and second (5) centers of curvature.

4,940,076

METHOD AND APPARATUS FOR STEERING CASTING BELTS OF CONTINUOUS METAL-CASTING MACHINES

S. Jerry Desautels, and Timothy D. Kaiser, both of Colchester, Vt., assignors to Hazelett Strip-Casting Corporation, Colchester, Vt.

Filed May 9, 1989, Ser. No. 348,976
Int. Cl.[5] B22D *11/06*
U.S. Cl. 164—452 **19 Claims**



1. The method of steering a revolving endless flexible metallic casting belt of a continuous metal-casting machine, said machine including a steering sensor and mechanism that directly controls the lateral direction of belt tracking, the method including the steps of

applying a cue device to said casting belt,

by means of said steering sensor, sensing the lateral position of the belt edge in response to the passage of said cue device past a stationary sensing device,

signaling information of said position to an information processing device which excludes signals originating from other areas of the belt, with the final step of

employing the output of said information processing device to steer said casting belt by means of said mechanism that directly controls the lateral direction of belt tracking.

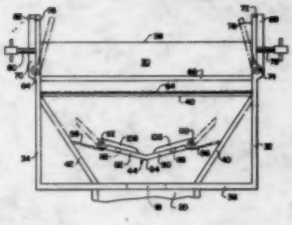
4,940,077

METHOD OF AND APPARATUS FOR DIRECT METAL STRIP CASTING

LeRoy Honeycutt, III; James C. Key, and Herbert Moody, III, all of Salisbury, N.C., assignors to Reynolds Metals Company, Richmond, Va.

Filed Nov. 21, 1988, Ser. No. 273,606
Int. Cl.[5] B22D *11/00, 11/10, 27/04*
U.S. Cl. 164—463 **15 Claims**

1. An open tundish for flowing molten metal directly onto a single moving chill surface for direct casting of a running length of thin metal strip of predetermined width, the tundish comprising a bottom wall, opposed sidewalls, an end wall having an inlet for admitting a stream of molten metal, an open end opposite said end wall providing an outlet for free flowing of molten metal onto the moving chill surface in a stream having a transverse width equal to the predetermined width



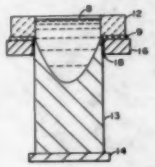
for solidification from said chill surface to form a strip, and strip width adjusting means for changing the width of strip being cast, the strip width adjusting means including means for changing the transverse dimension of said tundish open end at said outlet during strip casting to thereby change the width of the stream of molten metal flowing onto the moving chill surface.

4,940,078

OIL RING FOR CASTING

Diane D. Martin, Lafayette, Ind., assignor to Aluminum Company of America, Pittsburgh, Pa.

Filed Nov. 30, 1988, Ser. No. 278,216
Int. Cl.[5] B22D *11/07*
U.S. Cl. 164—472 **11 Claims**



1. A method of using a flat ring comprising an alloy of 1 to 8% copper, balance aluminum, said method comprising situating the ring as an oil ring in a continuous casting apparatus for casting aluminum or aluminum alloy.

4,940,079

OPTIMAL CONTROL SYSTEM FOR REFRIGERATION-COUPLED THERMAL ENERGY STORAGE

Jerry Best, Sacramento; Richard C. Bourne; Marc Hoeschele, both of Davis, and Willem Bos, Sacramento, all of Calif., assignors to Phenix Heat Pump Systems, Inc., Elk Grove, Calif.

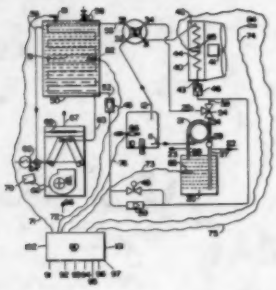
Filed Aug. 11, 1988, Ser. No. 230,897
Int. Cl.[5] F25B *13/00*
U.S. Cl. 165—2 **66 Claims**

1. A method of controlling both the heating and cooling modes of a refrigeration-coupled thermal energy storage system, the control method comprising the steps of:

selecting between the heating and cooling modes based upon outdoor temperature history;

establishing target cooling and heating storage conditions based upon outdoor temperature history;

operating the system in the cooling mode, when selected, until the target cooling storage condition is achieved, such that cooling storage quantity increases with increases in outdoor temperature; and



operating the system in the heating mode, when selected, until the target heating storage condition is achieved, such that heating storage quantity increases with decreases in outdoor temperature.

4,940,080

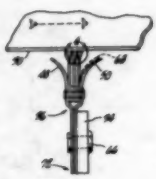
BI-DIRECTIONAL FLEXIBLE SEAL

Richard L. Reeves, Homeland, and Dennis Woodland, Corona, both of Calif., assignors to Reeves & Woodland Industries, Homeland, Calif.

Filed Jul. 20, 1989, Ser. No. 382,848

Int. Cl.[5] F28D *19/04*

U.S. Cl. 165—9 **13 Claims**



1. A flexible radial bi-directional seal for an air preheater comprising:

a first base plate;

a second base joined to said first base plate; each plate having a planar section and an oppositely curved flange; and

a plurality of flexible spaced apart leaves mounted at least partially in between said first and second base plates.

4,940,081

CHECKER BRICK

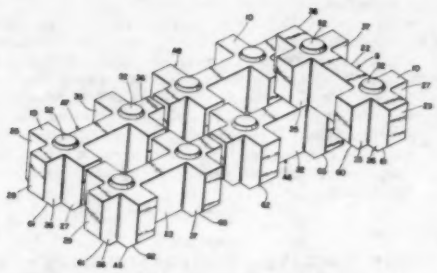
Jack Hyde, Pittsburgh, Pa., assignor to North American Refractories Company, Cleveland, Ohio

Filed Jul. 31, 1989, Ser. No. 386,947

Int. Cl.[5] F28D *17/02*

U.S. Cl. 165—9.1 **25 Claims**

1. A checker brick including walls intersecting at a plurality of spaced intersections having intersection centerlines, a common wall extending between each adjacent pair of said intersections, four walls (including said common walls) extending outwardly from each said intersection and being equidistantly-spaced therearound, said four walls at each intersection that are not common walls being independent walls, said brick having top and bottom surfaces, and each said intersection having a projection on one of said surfaces and a mating recess on the opposite one of said surfaces, whereby a plurality of



bricks are stackable in interlocked relationship with said projections and recesses on adjacent bricks interdigitated.

4,940,082

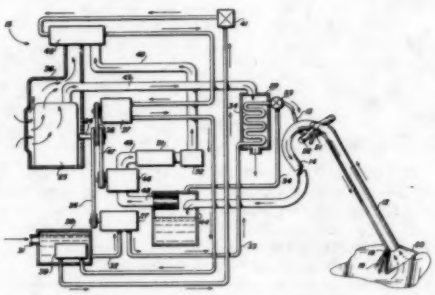
CLEANING SYSTEM

James R. Roden, Phoenix, Ariz., assignor to Professional Chemicals Corporation, Chandler, Ariz.

Filed Dec. 19, 1988, Ser. No. 286,616

Int. Cl.[5] A47L *7/00, 5/12, 11/34;* **F25B** *29/00*

U.S. Cl. 15—321 **4 Claims**



1. A cleaning system comprising in combination a liquid heating system comprising an air cooled internal combustion engine, means for conveying cooling air away from the engine, means for conveying exhaust gases away from the engine, first and second heat exchangers, means for conveying the liquid to be heated through said first and second heat exchangers, and a heat pump comprising a compressor driven by said engine, a condenser associated with said first heat exchanger, an expansion device and an evaporator associated with the means for conveying cooling air away from the engine, said second heat exchanger being associated with the means for conveying exhaust gases away from the engine, a spray nozzle operatively connected to the liquid conveying means to spray liquid heated by said first and second heat exchangers, a vacuum nozzle for retrieving liquid sprayed by said spray nozzle, a vacuum pump driven by said engine and connected to said vacuum nozzle for withdrawing liquid and air into said vacuum nozzle, and means for conveying air withdrawn into said vacuum nozzle to said heat pump evaporator.

4,940,083

APPARATUS FOR CONDITIONING AIR FOR A VEHICLE COMPARTMENT

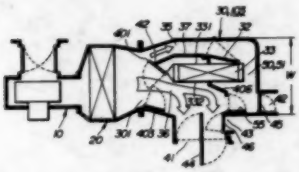
Yasushi Takenaka; Takeshi Sugiyama, and Shunsuke Kajita, all of Kanagawa, Japan, assignors to Nissan Shatai Company, Limited, Hiratsuka, Japan

Continuation of Ser. No. 89,968, Aug. 27, 1987, abandoned. This application Aug. 11, 1988, Ser. No. 231,225

Claims priority, application Japan, Aug. 29, 1986, 61-203189; Mar. 31, 1987, 62-48173[U]

Int. Cl.[5] B60H 1/02

U.S. Cl. 165—42 11 Claims



1. A structure of an air conditioning apparatus comprising:

(a) a casing having at least one air inlet at one end thereof and at least one air outlet at the other end thereof, air outside the casing being introduced into an internal space of the casing via the at least one air inlet and formed into an air stream within the internal space and the air stream formed within the casing being supplied into a limited space via the at least one air outlet;

(b) a blower unit installed at the one end of the casing adjacent to the at least one air inlet for blowing the introduced air toward the other end of the casing to form the air stream;

(c) first means disposed downstream of the blower unit for cooling the air stream;

(d) a heater unit disposed downstream of the first means for heating the air stream passed through the first means to supply a heated air stream to the limited space via the at least one air outlet, the heater unit having an elongated rectangular shape in section including a pair of opposed first and second walls and a pair of opposed elongated third and fourth walls, the elongated third and fourth walls of heater unit being disposed substantially parallel to the air stream exiting from the first means so as to minimize air resistance against the air stream with a bypass air stream passage being defined by the second wall and a first wall of the casing;

(e) a first air mixing door member having a pivotal end located at a portion of the internal space adjacent to and upstream of the first wall of the heater unit for adjusting an amount of the air stream to be passed through the heater unit; and

(f) a first partitioning member disposed between a position at which the first air mixing door member is placed in a maximum cooling mode within the internal space and a substantial half portion of the third wall of said heater unit so that a first air stream passage is formed so as to face toward an upstream first half portion of the third wall and a second air stream passage is formed so as to face toward a downstream second half portion of the third wall, the bypass air passage placed between the second heater unit wall and the first wall of the casing also being formed.

4,940,084

HEAT EXCHANGER COMPRISED OF SECTIONS DETACHABLY AND SEALABLY CLAMPED TOGETHER AND ITS METHOD OF ASSEMBLY

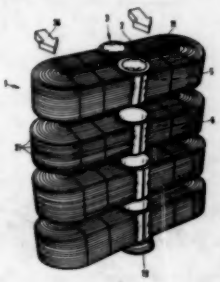
Hubert Grieb, Germering, Fed. Rep. of Germany, assignor to MTU Motoren Und Turbinen- Union Munchen GmbH, Munich, Fed. Rep. of Germany

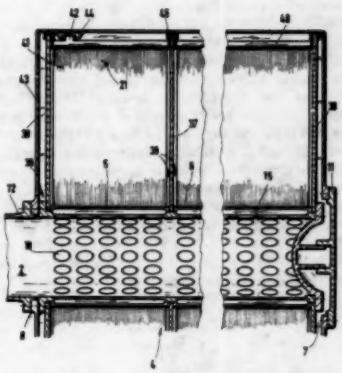
Filed Jan. 30, 1989, Ser. No. 303,921

Claims priority, application Fed. Rep. of Germany, Feb. 10, 1988, 3803947

Int. Cl.[5] F28F 9/02

U.S. Cl. 165—76 12 Claims





1. A heat exchanger comprising two substantially parallel manifold ducts and a plurality of heat exchange tubes connected to said ducts and arranged in bundles extending axially of the ducts, each of said ducts comprising a plurality of duct sections arranged axially one after the other in detachable abutting relation and a tension member extending axially of the ducts in spaced relation within the respective duct sections and applying compression to the endmost duct sections to press the duct sections against one another, said tension member having a smaller coefficient of thermal expansion than said ducts.

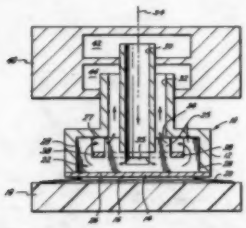
9. A method of assembling a heat exchanger comprising arranging in axial succession a plurality of sections each including a pair of parallel manifold duct elements connected by a plurality of heat exchange tubes, pressing the manifold duct elements of the adjoining sections together in detachable sealed relation by applying compressive forces to the endmost duct elements by a tension member extending axially of the duct elements in spaced relation therewith and clamping between adjoining duct elements an intermediate plate which extends between the heat exchange tubes of the adjoining sections.

4,940,085

FLUID HEAT EXCHANGER FOR AN ELECTRONIC COMPONENT

Richard D. Nelson, Austin, Tex.; Omkarnath R. Gupta, Fremont, Calif., and Dennis J. Herrell, Austin, Tex., assignors to Microelectronics and Computer Technology Corporation, Austin, Tex.

Continuation-in-part of Ser. No. 251,273, Sep. 30, 1988, Pat. No. 4,909,315. This application Nov. 27, 1989, Ser. No. 441,679
Int. Cl.[5] H01L *23/46*
U.S. Cl. 165—80.3 5 Claims



1. A fluid heat exchanger for cooling an electronic component comprising,

a housing having a base for receiving heat from an electronic component,

a plurality of spaced fins each having a top, bottom, and two ends, said bottoms connected to the base, and said fins being perpendicular to the base,

a first fluid tube communicating with the housing opposite the base and having a longitudinal axis perpendicular to the base, said axis directed towards the fins between the ends of the fins for transmitting a cooling fluid between the first tube and the fins, the base and the ends of the fins, and a second fluid tube in communication with the fins,

the tops of the fins including a recess in communication with the first tube for communicating fluid between all of the fins and the first tube, and

a plate between the top and bottom of the fins extending generally parallel to the base and extending toward but spaced from the ends of the fins for directing the cooling fluid in a double pass against the fins.

4,940,086

TANK FOR A HEAT EXCHANGER

Kevin E. Stay, Greenfield, Wis., assignor to Modine Manufacturing Company, Racine, Wis.

Filed Apr. 16, 1987, Ser. No. 39,473
Int. Cl.[5] F28F *9/02*
U.S. Cl. 165—173 3 Claims

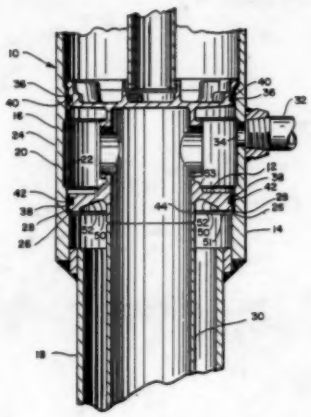
1. In a plastic tank for a vehicular radiator having an elongated trough-like configuration including two elongated, spaced, generally parallel walls subject to "suck-in", relatively short, opposed end walls interconnecting said parallel walls, and an elongated opening defined by said walls and by a peripheral flange having a planar sealing surface subject to "banana-ing", the improvement wherein said walls, in close adjacency to said flange, include a substantially peripheral step.

4,940,087

SEATING ARRANGEMENT AND STRUCTURE OF A SPOOL WITHIN A WELL CASING

Neil C. Lien, and Donald G. Olsen, both of Evansville, Wis., assignors to Baker Manufacturing Company, Evansville, Wis.

Filed May 26, 1989, Ser. No. 357,528
Int. Cl.[5] E21B *33/04, 43/00*
U.S. Cl. 166—88 10 Claims



1. A well construction having a vertical well casing and a spool, the spool being insertable into the well casing and the spool having a flange with a skirt that bottoms against a collar in the well casing to form a seated contact engagement between the skirt and the collar, a support web connected to the flange and extending substantially perpendicular to the skirt, the support web having an undersurface which extends upwardly and radially inwardly from the flange, a sleeve section connected to the web radially inwardly thereof from which a pipe section is suspended therefrom, and a ring portion at a junction of the support web and the sleeve about which transmitted forces are resolved, the skirt and the collar being angled at an angle θ relative to the vertical such that θ has a value less than tan θ equal to $1/\mu$ and greater than tan θ equal to μ where μ equals the coefficient of static friction between the skirt and the collar.

4,940,088

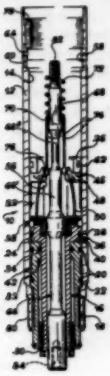
SONDE FOR TAKING FLUID SAMPLES, IN PARTICULAR FROM INSIDE AN OIL WELL

P. Goldschild, Vulaines/Seine, France, assignor to Schlumberger Technology Corporation, Houston, Tex.

Filed Mar. 1, 1989, Ser. No. 317,709
Claims priority, application France, Mar. 3, 1988, 88 02680
Int. Cl.[5] E21B *49/08;* G01N *1/14*
U.S. Cl. 166—109 15 Claims

1. A sonde for taking fluid samples comprising: at least one sampling device, each said sampling device comprising a tubular body, a suction piston slidably mounted inside said tubular body in such a manner as to define a sampling chamber behind said suction piston, an admission orifice formed through said tubular body to admit fluid into said sampling chamber, and means for displacing said suction piston inside said tubular body, wherein said means for displacing said suction piston comprise a control rod which passes freely through said suc-

tion piston, and clutch means for coupling said control rod to said suction piston prior to taking a sample, and then for decoupling said control rod from said suction piston after the sample has been taken.



4,940,089

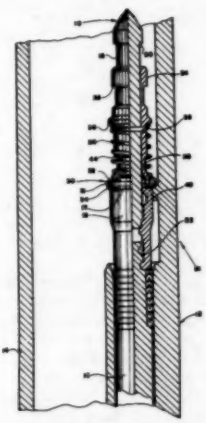
LATCHING DEVICE

Ben D. Terral, 118 Timberwilde, Huntsville, Tex. 77340

Division of Ser. No. 64,872, Jun. 19, 1987, Pat. No. 4,813,730. This application Dec. 5, 1988, Ser. No. 279,995

Int. Cl.[5] E21B 23/03

U.S. Cl. 166—117.5 **14 Claims**



1. A latching device for selectively locking and retrieving a vertically oriented well tool from a vertically oriented tubular receiver having an inwardly projecting locking shoulder with upper and lower angularly bevelled surfaces, the latching device comprising:

a means for attaching the latching device to an upper portion of the well too;

a substantially cylindrical body provided with means to facilitate installation of the latching device within the tubular receiver;

a locking sleeve means mounted in axially slidable, surrounding relationship on the cylindrical body, said locking sleeve having an upper shoulder to facilitate retrieval of the latching device from the tubular receiver, an intermediate shoulder, a lower shoulder, a reduced diameter cylindrical body portion extending between the intermediate shoulder and the lower shoulder and further having an enlarged diameter lower portion;

an annular locking ring mounted on the locking sleeve means for effectively locking the latching device in the tubular receiver, an internal diameter of the locking ring being greater than an external diameter of the reduced diameter cylindrical body portion of said locking sleeve allowing the locking ring to be shifted by said locking shoulder to an axially angulated positioned relative to said locking sleeve when passing the locking shoulder of the tubular receiver, the locking ring having upper and lower angularly bevelled surfaces which are angled to be complementary to the bevelled surfaces of the locking shoulder of the tubular receiver and which contact the respective beveled surfaces of the locking shoulder during locking and retrieving of the well tool;

a spring means compressively arranged to urge the locking ring downwardly relative to said well tool, said spring means being compressed by the locking ring when the locking ring passes the locking shoulder of the tubular receiver and being released after passing of the locking shoulder by the locking ring.

4,940,090

ORGANICALLY CROSSLINKED POLYVINYL ALCOHOL COPOLYMERIC GELS FOR USE UNDER HARSH RESERVOIR CONDITIONS

Dennis H. Hoskin, Lawrenceville, and Paul Shu, West Windsor, both of N.J., assignors to Mobil Oil Corporation, New York, N.Y.

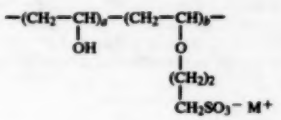
Filed May 11, 1989, Ser. No. 350,499

Int. Cl.[5] E21B 43/22, 43/24, 33/138

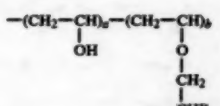
U.S. Cl. 166—270 **9 Claims**

1. A process for recovering oil from a subterranean oil-bearing formation having relatively high permeability zones and relatively low permeability zones penetrated by at least one production well in fluid communication with a substantial portion of the formation, comprising the steps of:

(a) injecting into the formation an aqueous gel-forming composition comprising water, a water-dispersible polyvinyl alcohol copolymer, said polyvinyl alcohol copolymer selected from the group consisting of copolymers of vinyl alcohol and vinyl alkyl sulfonate ether having the structure:



and copolymers of vinyl alcohol and vinyl-acrylamido ether, having the following structure:



wherein:

R is an alkyl or aryl group having up to 10 carbon atoms;

M^+ is Na^+, K^+ or other counter ions; and

a and b are mole fractions of each co-monomer unit such that $a+b=1$, and $a>0$ and $b>0$;

and a crosslinking agent which is a mixture of a phenolic

component and an aldehyde, said crosslinking agent present in an amount effective to cause gelation of said polyvinyl copolymer;

(b) injecting a flooding fluid into the formation that preferentially enters the low permeability zones; and

(c) recovering fluids including oil from the formation via the production well.

4,940,091

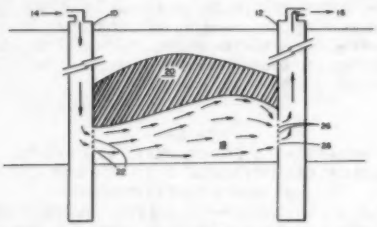
METHOD FOR SELECTIVELY PLUGGING A ZONE HAVING VARYING PERMEABILITIES WITH A TEMPERATURE ACTIVATED GEL

Paul Shu, West Windsor, N.J., and Winston R. Shu, Dallas, Tex., assignors to Mobil Oil Corporation, New York, N.Y.

Filed Jan. 3, 1989, Ser. No. 292,795

Int. Cl.[5] E21B *43/22, 43/24, 33/138*

U.S. Cl. 166—270 **20 Claims**



1. A method for closing pores in a heated zone of a formation having zones of varying permeability comprising:

(a) heating by steam injection a zone of said formation to a temperature above about 300° F. sufficient to cause a temperature activated aqueous gellable mixture to form a solid gel which mixture contains

(i) a water dispersible polymer,

(ii) a phenolic compound, and

(iii) an aldehyde producing compound which upon reaching a temperature above about 300° F. decomposes to yield an aldehyde and form a phenolic resin in situ in combinaton with the phenolic compound sufficient to gel the polymer;

(b) terminating steam injection into the formation upon reaching said temperature; and

(c) injecting thereafter into said formation the temperature activated gellable mixture which mixture enters said zone heated to said temperature, where it is heated to a temperature sufficient to cause a solid gel to form and close pores in said heated zone regardless of the permeability of said zone.

4,940,092

WELL CLEAN OUT TOOL

Fred S. Ferguson, 23434 Wintergate Dr., Spring, Tex. 77373, and Lonnie K. Perry, P.O. Box 914, Wink, Tex. 79789

Filed Jul. 21, 1989, Ser. No. 383,005

Int. Cl.[5] E21B *37/00*

U.S. Cl. 166—311 **19 Claims**

1. A downhole well clean out tool for removing sand and debris from a well bore comprising:

an elongate string connectable to a source of reciprocating and rotating motion located at the surface, the string including;

at least one vertically extending debris-receiving and trapping sub positioned in said string having an outlet at the upper end thereof, and an inlet at the lower end thereof and at least one debris-trapping valve operatively positioned at the inlet end to open and close the inlet to said debris-receiving sub,

an elongate tubular pump barrel connected at its lower end in fluid communication with the outlet of said debris-receiving and trapping sub and having fluid outlets through its side wall near its upper end and enclosed at its top end,

an elongate vertically extending pump mandrel extending reciprocally through the enclosed top end of said pump barrel and keyed thereto to allow reciprocal vertical movement relative to said pump barrel while preventing rotational movement relative thereto whereby said pump barrel and said pump mandrel will rotate as a single unit upon rotation of said pump mandrel,

a top sub member connected at its lower end to the top end of said pump mandrel and its top end adapted to be connected in fluid communication to a drill string extending to the surface of the well bore and having fluid outlets through its side wall near its lower end,

a swab assembly reciprocally contained within said pump barrel including a swab bypass mandrel connected at its top end to the bottom end of said pump mandrel and having at least one longitudinal bypass channel on its circumference and axially spaced stop shoulders at each end of said bypass channel with a smooth cylindrical portion between the bottom end of said bypass channel and the lower stop shoulder, and at least one swab member slidable vertically on said bypass mandrel with the upper stop shoulder forming a stop for the swab member in its uppermost position and the lower stop shoulder

forming a stop for the swab member in its lowermost lifting position,

said swab member having an interior diameter configured to allow fluid circulation through said bypass channel in its uppermost position and in its lowermost lifting position to form a fluid sealing relation with said bypass mandrel smooth cylindrical portion to close off circulation through said bypass channel and having an exterior diameter configured to form a sliding fluid sealing relation with the interior surface of said pump barrel, whereby

after the tool is fully extended and on the down stroke said swab bypass mandrel will move downward relative to said swab member engaging it with the upper stop shoulder to allow passage of fluid through said bypass mandrel channel and said pump barrel and said top sub fluid outlets to relieve hydraulic action of fluid inside said pump barrel and allow said debris-trapping valve to close and capture sand and debris in said debris-receiving and trapping sub, and

when the tool is on the up stroke, said swab bypass mandrel moves upward relative to said swab member to engage said swab member with the lower stop shoulder in a sealing relation with said bypass mandrel smooth cylindrical portion below the channel and said swab member exterior diameter forms a sliding fluid sealing relation with said

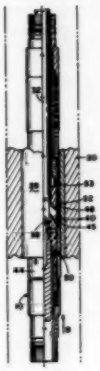
pump barrel interior surface and as said swab assembly is raised relative to said pump barrel causing hydraulic action to open said debris-trapping valve allowing sand and debris to enter said debris-receiving and trapping sub and the fluids within said pump barrel above said swab member to be discharged out through the fluid outlets near the top portion of said pump barrel.

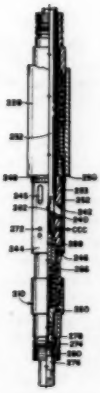
4,940,093

GRAVEL PACKING TOOL

Y. Gilbert Hilsman, III, Tulsa, Okla., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Sep. 6, 1988, Ser. No. 241,170
Int. Cl.[5] E21B *34/10*
U.S. Cl. 166—332 **4 Claims**





1. An apparatus for closing a reverse circulation passage and opening a crossover fluid passage in a gravel packing service tool which sets a well packer comprising:

(a) closure means for closing said reverse circulation passage including (i) a valve ring having a substantially cylindrical bore and a radially disposed upper surface; and (ii) a substantially cylindrical rod and piston assembly movable within said bore, said assembly including a partial axial fluid flow passage and a connecting radially disposed fluid port whereby fluid flowing within said fluid flow passage flows outwardly of said assembly through said port when said port is in an open position axially away from said radially disposed upper surface and resilient damper means comprising restricted fluid passage openings between an upper fluid chamber and a lower fluid chamber of said cylindrical bore restraining movement of said piston within said bore and maintaining said port in said open position under relatively low fluid pressure conditions, and

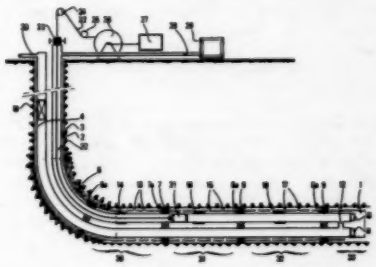
(b) opening means for opening said crossover fluid passage comprising a sliding sleeve and a snap ring intermediate said sliding sleeve and a packer which engages a corresponding shoulder on said packer in response to an axial lifting force on said service tool whereby said sliding sleeve moves axially to open said crossover passage.

4,940,094

METHOD AND DEVICE TO ACTUATE SPECIALIZED INTERVENTION EQUIPMENT IN A DRILLED WELL HAVING AT LEAST ONE SECTION HIGHLY SLANTED WITH RESPECT TO A VERTICAL LINE

Jacques Lessi, Maule, and Michel Tholance, Feucherolles, both of France, assignors to Institut Francais du Petrole, Rueil-Malmaison, France

Filed Aug. 19, 1988, Ser. No. 234,076
Claims priority, application France, Aug. 19, 1987, 87 11749
Int. Cl.[5] E21B *34/14*
U.S. Cl. 166—373 **15 Claims**



1. Method for actuating specialized operating equipment in a drilled well having at least one well zone sharply slanted with respect to a vertical, said drilled well having at least one first tubular control column along which the specialized operating equipment are remotely installed, the method comprising the steps of:

introducing a control member into said first tubular control column,

attaching a cable means at one end of said control member,

lowering said control member into said first tubular control column by downward hydraulic pumping,

bypassing specialized operating equipment which is to remain inoperative while allowing the control member to be positioned so as to enable selective specialized operating equipment to be operated,

paying out the cable means from the surface into the first tubular control column,

raising the control member by pulling on the cable means from the surface, and

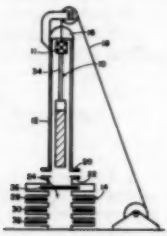
selectively maneuvering the specialized operating equipment while the control member is flush against said specialized operating equipment in a downward or upward travel of the control member in the drilled well.

4,940,095

DEPLOYMENT/RETRIEVAL METHOD AND APPARATUS FOR WELL TOOLS USED WITH COILED TUBING

Kenneth R. Newman, Richmond, Tex., assignor to Dowell Schlumberger Incorporated, Tulsa, Okla.

Filed Jan. 27, 1989, Ser. No. 303,592
Int. Cl.[5] E21B *33/068, 23/00*
U.S. Cl. 166—378 **5 Claims**



1. A method of inserting a well service tool into a wellbore having a wellbore axis, the well service tool having a central bore and a valve within the bore comprising the sequential steps of:

(a) inserting the well service tool into a lubricator having a closed first end portion with a control cable extending therethrough and connected to the well service tool and a second open end portion incorporating means for connecting the lubricator to a wellhead;

(b) axially aligning the well service tool and the lubricator along the axis and connecting the lubricator to the wellhead;

(c) inserting at least a portion of the well service tool into the wellbore so that a portion of the tool is adjacent at least one pair of pipe rams in the wellhead;

(d) closing the pipe rams against an outer surface of the well service tool to hold the well service tool in position and effect a fluid-tight seal against the tool within the wellbore, and

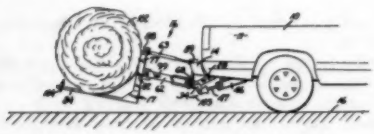
(e) removing the lubricator from the wellhead and disconnecting the control cable from the well service tool.

4,940,096

THREE POINT HITCH FOR TRUCK

Jerry A. Johnson, Rte. 1, Box 217, Devils Lake, N. Dak. 58301

Filed Sep. 11, 1989, Ser. No. 405,316
Int. Cl.[5] A01B *59/043*
U.S. Cl. 172—443 **23 Claims**



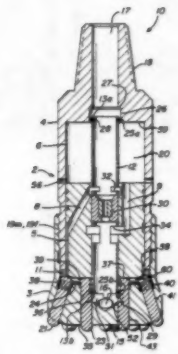
15. A hitch for a truck including longitudinally extended frame means having a rear end portion, a transverse rear bumper secured to the rear end portion of the frame means, comprising support means connected to the frame means, transverse tube means located below said bumper secured to the support means, shaft means rotatably mounted on and extended through said tube means, said shaft means having opposite ends, a first lift draft arm, a second lift draft arm, said first and second lift draft arms being movable from rearward extended positions to folded positions below said bumper, first upright pivot means connecting the first lift draft arm to one end of the shaft means, second upright pivot means connecting the second lift draft arm to the other end of the shaft means whereby said first and second lift draft arms can be folded adjacent each other below said bumper, means for holding the first and second lift draft arms folded adjacent each other, means limiting the rearward extended positions of the first and second lift arms, crank arm means secured to the shaft means, extendible and contractable means secured to the crank arm means and frame means, and means for operating the extendible and contractable means to rotate the shaft means to selectively raise and lower the first and second lift arms.

4,940,097

FLUID POWERED ROTARY PERCUSSION DRILL WITH FORMATION DISINTEGRATION INSERTS

Leo A. Martini, 2624 Montclair, Mesquite, Tex. 75150

Filed Dec. 13, 1988, Ser. No. 283,855
Int. Cl.[5] E21B *10/38, 10/46*
U.S. Cl. 175—296 **13 Claims**



1. A fluid powered rotary percussion drill for drilling earth bore holes with a conventional drill string comprising:

a percussion dri motor housing, the upper end thereof being hollow to pass fluid flow and adapted for threaded connection to said conventional rotary drill string;

a piston having upper and lower ends internally fitted to said drill motor housing for vertical reciprocating motion therein between upper and lower limits;

valving means passing through said piston for alternately directing fluid pressure admitted through said hollow upper end of said drill motor housing to said upper and lower piston ends thereby affecting said vertical reciprocating motion and for enabling the movement of said piston from a first position allowing for continuous piston oscillation to a second position disabling piston oscillation and permitting voluminous fluid flow through the drill;

a percussion drill bit body having an upper section adapted for threaded connection to the lower end of said motor housing and a lower section including a downwardly oriented drilling face;

a plurality of vertical and inclined inserts guide holes passing through said drill bit in a spaced pattern; and

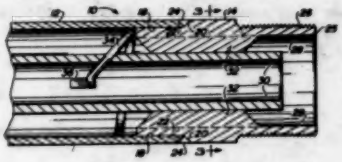
a substantially cylindrical insert having first and second send fitted in each said insert guide hole for longitudinal movement therewith wherein said first end is adapted for contact with said lower end of said piston and said second end is adapted for percussive contact with the bottom of said earth bore and wherein one or more of said plurality of inserts contacts said valving means when said insert is placed longitudinally, thereby shifting said piston from its second non-oscillation position to its first oscillation position.

4,940,098

REVERSE CIRCULATION DRILL ROD

Daniel H. Moon, 6942 E. Redbud Rd., Tucson, Ariz. 85715

Filed May 26, 1989, Ser. No. 357,117
Int. Cl.[5] E21B 17/18
U.S. Cl. 175—320 11 Claims



1. In a reverse circulation drill rod of the dual tube type providing for passage of fluid down through the drill rod in one direction and for up return of the fluid, together with drill cuttings or rock fragments in the other direction, the drill rod consisting of connected multiple identical sections, a drill rod section comprising:

an elongated cylindrical outer tube having a first end and a second end;

an elongated cylindrical pin operably attached to said outer tube first end, said pin having an outer cylindrical surface with internal circular bore therethrough and a plurality of spaced apart radially directed inwardly protruding lands attached to said internal bore, said lands having end surfaces;

an elongated cylindrical box operably attached to said outer tube second end, said box having an outer cylindrical surface with internal circular bore therethrough and a plurality of spaced apart radially directed inwardly protruding lands attached to said internal bore, said lands having end surfaces;

an inner tube situated concentrically interiorly to and operably attached to said outer tube, pin, and box, said inner tube having limited longitudinal freedom of movement within said outer tube, pin, and box, said elongated cylindrical pin and elongated cylindrical box plurality of protruding lands end surfaces adapted to receive, secure, and align said inner tube situated concentrically interiorly of said pin and said box for connection to adjacent sections; and

means limiting the freedom of longitudinal movement of said inner tube within said outer tube, said means including a first coil spring having two ends, one end of which is operably attached to said inner tube and the second end is juxtaposed said pin and said outer tube whereby said inner tube may move longitudinally relative to said outer tube, pin, and box when connecting multiple sections of said drill rod, said pin of one section connective to said box of the adjacent section, the passage of fluid down through the drill rod passes through the cylindrical annulus formed between the outer tube and the inner tube, and between said pin internal circular bore lands and said inner tube, and the up return of the fluid, drill cuttings or rock fragments, passed through the inner tube.

4,940,099

CUTTING ELEMENTS FOR ROLLER CUTTER DRILL BITS

John D. Deane; Craig R. Ivie, and Percy W. Schumacher, all of Houston, Tex., assignors to Reed Tool Company, Houston, Tex.

Filed Apr. 5, 1989, Ser. No. 333,576
Int. Cl.[5] E21B 10/16, 10/50
U.S. Cl. 175—374 2 Claims

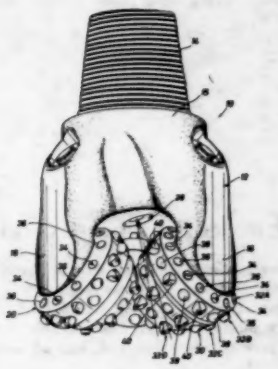
1. A rotary drill bit for drilling a well bore hole and comprising:

a bit body having an upper end adapted to be detachably secured to a drill string for rotation of the drill bit, and at least one depending leg at its lower end having a generally cylindrical bearing journal;

a roller cutter mounted for rotation on said journal and having a generally frusto-conical body defining a generally frusto-conical body defining a generally frusto-conical outer surface; and

a plurality of cutting inserts arranged in a plurality of spaced concentric annular rows on said body, said cutting inserts having outer cutting surfaces formed of a wear-resistant material and adapted to bear on the formation of the well bore hole for drilling the bore hole, each of said annular rows having a plurality of cutting inserts therein spaced from each other;

one of said rows of cutting elements being a reaming insert row positioned adjacent a gage row of cutting elements and adapted to engage the cylindrical side wall of the bore hole for maintaining the diameter of the bore hole, said reaming insert row comprising a plurality of spaced cut-



ting elements each having a generally planar cutting face substantially flush with the adjacent outer surface of the cutter body and extending in a plane generally at right angles to the bottom of the bore hole for engaging the side wall surface of the bore hole;

at least some of the cutting surfaces of the cutting inserts in said reaming insert row being formed of a substantially harder wear-resistant material than the cutting surfaces of the remaining cutting inserts in said reaming insert row and intermingled in a generally uniformly spaced pattern with said remaining cutting inserts, the cutting surfaces of said remaining cutting elements being substantially tougher than the cutting surfaces of said cutting inserts having the substantially harder wear-resistant material whereby said reaming insert row of cutting inserts has cutting surfaces formed of predetermined different physical properties and intermingled in a predetermined pattern for increasing the life of the bit when different types of formations are encountered.

4,940,100

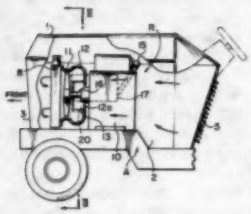
MOTOR VEHICLE

Yoshiteru Ueda, Kakogawa, Japan, assignor to Kawasaki Jukogyo Kabushiki Kaisha, Japan

Filed Feb. 23, 1989, Ser. No. 313,901
Claims priority, application Japan, Feb. 23, 1988, 63-23685[U]
Int. Cl.[5] B60K 11/08
U.S. Cl. 180—68.1 4 Claims

1. A motor vehicle comprising an engine housing having a closed front end; a radiator arranged in a front part of said engine housing; an engine arranged in a rear part of said engine

housing; an air inlet provided at a rear part of the engine housing so that cooling air for cooling said radiator passes across in contact with at least one side of the engine and then flows



toward a front side of said radiator; and an air guiding duct connected to a rear side of said radiator so that the air passed through the radiator is discharged out of the engine housing without encountering the engine.

4,940,101

VENTING DEVICE FOR THE FUEL TANK OF A MOTOR VEHICLE

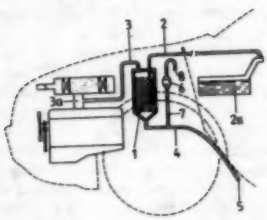
Armin Bauder, Neckarsulm, Fed. Rep. of Germany, assignor to AUDI AG, Fed. Rep. of Germany

Continuation of Ser. No. 254,492, Oct. 6, 1988, abandoned. This application Nov. 21, 1989, Ser. No. 441,348

Claims priority, application Fed. Rep. of Germany, Oct. 12, 1987, 3734414

Int. Cl.[3] F02M *23/12*

U.S. Cl. 180—69.4 **2 Claims**



1. A venting device for venting the fuel tank of a motor vehicle, comprising:

a fuel vapor filter connected by a first line to said fuel tank for collecting vapors and by a second line to the intake system of an internal combustion engine of the vehicle;

an aeration line connected to the lower end of said filter for aerating said filter, said aeration line extending downwardly to a location adjacent the road region of the vehicle and having an opening at it's lowermost end;

a vacuum limiting valve connected to said aeration line by a third line extending upwardly from said aeration lien to said valve; and

an air intake line extending from said valve with an opening for admitting air therein when the vacuum limiting valve opens in response to clogging of the aeration line.

4,940,102

MOTOR-DRIVEN POWER STEERING SYSTEM

Mitsuharu Morishita, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

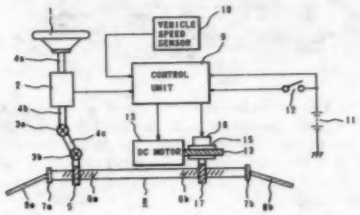
PCT No. PCT/JP87/00927, § 371 Date Sep. 20, 1988, § 102(e) Date Sep. 20, 1988, PCT Pub. No. WO88/04250, PCT Pub. Date Jun. 16, 1988

PCT Filed Nov. 30, 1987, Ser. No. 245,437

Claims priority, application Japan, Dec. 2, 1986, 61-288436

Int. Cl.[3] B62D *5/04*

U.S. Cl. 180—79.1 **7 Claims**



1. A motor-driven power steering system including a control unit (9) for controlling the rotational force of a DC motor (13) as an auxiliary steering force on the basis of a steering torque signal from a steering torque sensor (2) which detects the rotational force of a steering wheel and on the basis of a vehicle speed signal from a vehicle speed sensor (10) which detects the running speed of a vehicle and for turning an electromagnetic clutch (16) on and off in order to effectively and ineffectively control, respectively, the rotational force of said DC motor as said auxiliary steering force, wherein the motor-driven power steering system further includes a fail-safe relay (91) having a normally open contact which is disposed on a line for supplying power to said electromagnetic clutch, one end of a drive coil (91*a*) of said fail-safe relay being connected to a positive terminal of a battery source (11) through a key switch (12), the other end of said drive coil being connected to a fail-safe drive means (99) which disconnects said drive coil from receiving power if said control unit detects that an abnormal condition is present on the basis of said steering torque signal and said vehicle speed signal, and a motor drive circuit (92), connected to the positive terminal of the battery source through a fuse (18), for supplying power to said DC motor.

4,940,103

POWER STEERING SYSTEM FOR USE IN MOTOR VEHICLE

Fujio Moniyama, Hino, Japan, assignor to Hino Jidosha Kogyo Kabushiki Kaisha (Hino Motors, Ltd.), Tokyo, Japan

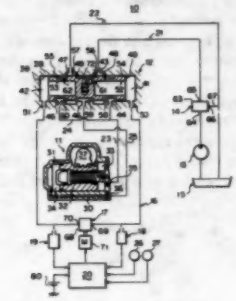
Continuation of Ser. No. 108,213, Oct. 14, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 412,537

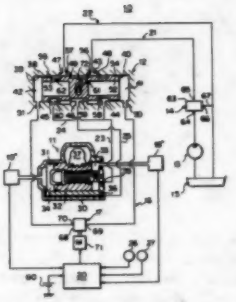
Int. Cl.[3] B62D *5/08, 6/00*

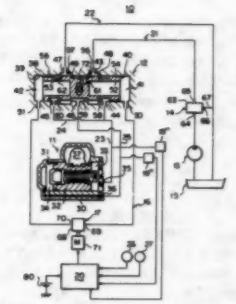
U.S. Cl. 180—132 **6 Claims**

1. A hydraulic circuit power steering system for use in a motor vehicle, comprising:

a power cylinder,
a control valve provided with a pair of reaction chambers,
a hydraulic pump,
a reaction passage intercommunicating said pair of reaction chambers,







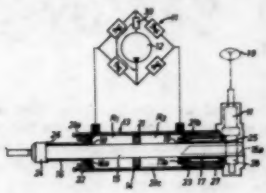
a reaction regulating valve disposed in said reaction passage and including an actuator activated by electric current,
means for sensing actual hydraulic pressure in the hydraulic circuit which is equivalent to the actual slip friction coefficient μ of the road surface and for generating a signal therefore,
means for sensing an actual speed of the motor vehicle and for generating a signal therefore,
means for sensing an actual steering value of the motor vehicle and for generating a signal therefore, and
control means, in which is previously input a valve representing a desired hydraulic pressure of said reaction chambers corresponding to a particular slip friction coefficient μ of the road surface, a particular motor vehicle speed and a particular motor vehicle steering value, for calculating a value based on the signals from said hydraulic pressure sensing means, speed sensing means and said steering value sensing means, for comparing the calculated value with the desired value, controlling the current flowing to the electric actuator and for controlling said reaction regulating valve so that the hydraulic pressure in said reaction chambers is caused to correspond to the desired value.

4,940,104

POWER-ASSISTED STEERING APPARATUS

Akira Hasegawa, Susono, Japan, assignor to Toyota Jidosha Kabushiki Kaisha, Japan

Filed Jun. 23, 1989, Ser. No. 370,684
Claims priority, application Japan, Jun. 24, 1988, 63-84404[U]
Int. Cl.[5] B62D 5/06
U.S. Cl. 180—132 **4 Claims**



1. A power-assisted steering apparatus of the type which includes a control valve arranged to control hydraulic fluid under pressure supplied to a hydraulic power cylinder from a hydraulic pump therethrough in response to the driver's steering effort applied thereto, said power cylinder having a piston mounted therein for reciprocating movement and a piston rod supporting thereon said piston for movement therewith and extending outwardly from said cylinder in opposite directions, wherein a pair of axially spaced cylindrical reaction pistons are slidably mounted on said piston rod one at each end of said power cylinder in such a manner as to be axially engageable at their inner ends with a pair of axially spaced internal end walls of said cylinder and at their outer ends with a pair of axially spaced retainer members on said piston rod when said power cylinder piston is retained in a neutral position.

4,940,105

STEERING GEAR FOR A VEHICLE

Tsugiharu Matsunaga, Aichi; Yasutaka Hayashi, Seto, and Katsuhiko Hattori, Nagoya, all of Japan, assignors to Kabushiki Kaisha Toyota Chuo Kenkyusho, Tokyo, Japan

Filed Mar. 21, 1988, Ser. No. 170,726
Claims priority, application Japan, Mar. 20, 1987, 62-67179
Int. Cl.[5] B62D 5/00
U.S. Cl. 180—133 **15 Claims**

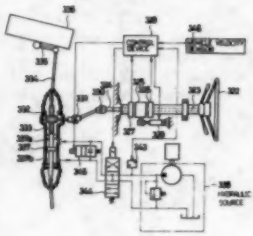
1. A steering gear for a vehicle comprising
an input device for receiving steering input from a driver,
a steering device coupled to the wheels of the vehicle for changing the steering angle of said wheels,
a steering drive unit including force generating means for driving said steering device,

a steering drive control device for operating said steering drive unit,

control means for controlling said steering drive control device on the basis of steering magnitude,

connecting means comprising two opposed members respectively coupled to the input device and the steering device, and

clutch means for selectively operatively connecting said two opposed members and thereby said input device and said steering device, said clutch means mechanically detecting relative displacement between said input device and said steering device and setting said clutch means in an engaged state in which the input device and steering device are operatively coupled when the relative displacement between the input device and the steering device reaches a predetermined abnormal value, said input device directly driving said steering device in said engaged state of said clutch means,



said two opposed members being movable relative to one another in a normal operation with said clutch means disengaged, said clutch means comprising a fitting portion on one of said members at a position corresponding to an abnormal value of relative displacement between said input device and said steering device, said two members being fitted together by said fitting portions to be integrally operable for both directions of movement of said members when the relative displacement between said input device and said steering device reaches said abnormal value,

releasable means for releasing said steering drive unit from said steering device, and

mechanical means for mechanically responding to the fitted condition of said two members for operating said releasable means when the clutch means achieves the engaged state whereby the input device is directly coupled to the steering device and the steering drive unit is released from the steering device.

4,940,106

ARTICULATED VEHICLE WITH HYDRAULIC STEERING

Harry E. Pedersen, and Ole V. Sorensen, both of Nordborg, Denmark, assignors to Danfoss A/S, Nordborg, Denmark

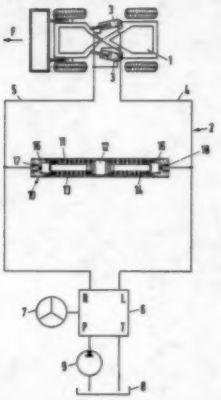
Filed May 1, 1989, Ser. No. 345,826

Claims priority, application Fed. Rep. of Germany, May 19, 1988, 3817031

Int. Cl.[5] B62D 5/06

U.S. Cl. 180—139 **16 Claims**

1. An articulated vehicle steerable in a first direction and an opposite second direction comprising a first and a second conduit that each have first and second end portions respectively, a hydraulic steering motor connected between the first ends of the first and second conduits, a control unit connected between the second ends of the first and second conduits that is operable for controlling the flow of pressurized fluid through the first and second conduit respectively, a pump for providing pressurized fluid to the control unit, a steering wheel operable in two directions for operating the control unit, and a double acting hydraulic shock absorber that has a response pressure of a predetermined value, the shock absorber including a longitudinally elongated tubular housing having a first end portion, a second end portion and an intermediate portion, first closure means for closing the first end portion of the housing and fluidly connecting the housing first end portion to the first conduit, second closure means for closing the second end portion of the housing and fluidly connecting the housing second end portion to the second conduit, a piston disposed in a datum position in the intermediate portion of the housing and being longitudinally movable away from the datum position toward each of the housing end portions with the direction of longitudinal movement depending upon the fluid pressure in the housing, the piston having a first end facing toward the housing first end portion and a second end facing toward the



housing second end portion, first pre-stressing means acting between the piston first end and the first closure means for constantly resiliently urging the piston toward the second closure means only when the piston has been moved away from the datum position toward the housing first end portion by fluid pressure at the second closure means that is at least a preselected amount higher than that at the first closure means and the piston is between its datum position and the first closure means, and second pre-stressing means acting between the piston second end and the second closure means for constantly resiliently urging the piston toward the first closure means only when the piston has been moved away from the datum position toward the housing second end portion by fluid pressure at the first closure means that is at least a preselected amount higher than that at the second closure means and the piston is between its datum position and the second closure means.

4,940,107

METHOD AND APPARATUS FOR CONTROLLING A POWER ASSIST STEERING SYSTEM

John-Cyril P. Hanisko, Southfield, Mich., assignor to TRW Inc., Lyndhurst, Ohio

Filed Sep. 23, 1988, Ser. No. 249,369

Int. Cl.[5] B62D 5/04

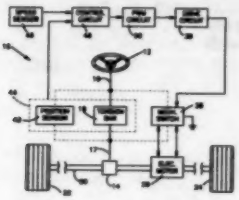
U.S. Cl. 180—142 **11 Claims**

9. An apparatus for providing a power assist control signal in an electrically controlled power assist steering system, said apparatus comprising:

means for providing a pulse-width modulated signal having a duty cycle that varies as a function of one of vehicle speed or applied steering torque;

means for controlling the amplitude of said pulse-width

modulated control signal as a function of the other of vehicle speed or applied steering torque; and



means for averaging the value of the pulse-width modulated signal, the averaged value being said power assist control signal.

4,940,108

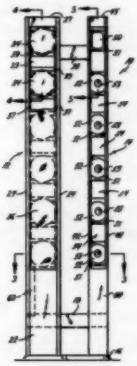
OPEN LINE SOURCE SPEAKER SYSTEM

John L. Selby, 1206 Perryville Rd., Cape Girardeau, Mo. 63701

Filed Feb. 24, 1989, Ser. No. 314,807

Int. Cl.[5] H05K *5/00*

U.S. Cl. 181—145 **22 Claims**



1. A loudspeaker system comprising:

a first vertical loudspeaker housing having a front, means mounting a first plurality of loudspeakers in a vertical column on the front of the first housing, the first plurality of loudspeakers including an uppermost loudspeaker and a lowermost loudspeaker in the column, the uppermost loudspeaker being at least four and one-half feet above the lowermost loudspeaker;

a second vertical loudspeaker housing having a front, the first and second housings being substantially equal in height, and means mounting a second plurality of loudspeakers in a vertical column on the front of the second housing, the second plurality of loudspeakers being equal in number to the first plurality of loudspeakers; and

spacer means connected between the first loudspeaker housing and the second loudspeaker housing, to maintain the first and second loudspeaker housings spaced apart by a predetermined distance.

4,940,109

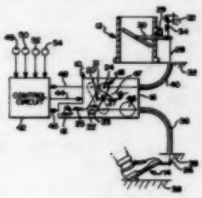
SPLIT ARM THROTTLE CABLE INTERVENTION DEVICE

David M. Preston, Madison Heights, and Donald R. Haefner, Oak Park, both of Mich., assignors to Eaton Corporation, Cleveland, Ohio

Filed Jul. 18, 1989, Ser. No. 381,551

Int. Cl.[5] B60K *13/02*

U.S. Cl. 180—197 **22 Claims**



1. A mechanism adapted to be interposed between an engine throttle body and an operator accelerator pedal for varying engine speed independently of operator demand, said mechanism comprising:

a first member adapted for slaved movement with said accelerator pedal between zero and full pedal travel positions;

a second member adapted for slaved movement with said throttle body between idle and full throttle positions;

motion transfer means including first and second lever portions mounted for limited relative rotation upon a pivot and interlinking said first and second members, said first member connected to said first lever portion at a first attachment point and said second member connected to said second lever portion at a second attachment point, said attachment points being spaced from one another and from said pivot;

means operative to fix the relative positions of said lever portions whenever said throttle is in other than said idle position and to permit relative rotation of said lever portions when said throttle is in said idle position; and

actuator means operative to selectively position said pivot to effect controlled displacement of said second member independent of displacement of said first member.

4,940,110

MOBILE WORK UNIT WITH RAISABLE AND LOWERABLE SUPPORT LEGS

Ulf Svensson, Badvägen 6 A, Sollentuna, Sweden S-191 43, and Bo Dahlgren, Sollentuna, Sweden, assignors to Ulf Svensson, Sollentuna, Sweden

PCT No. PCT/SE87/00295, § 371 Date Dec. 27, 1988, § 102(e) Date Dec. 27, 1988, PCT Pub. No. WO88/00262, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 24, 1987, Ser. No. 294,065

Claims priority, application Sweden, Jun. 24, 1986, 8602803

Int. Cl.[5] B62D *61//12*

U.S. Cl. 180—209 **11 Claims**

1. A mobile work unit comprising:

a body member;

a wheel through which the body member can be supported on a support surface;

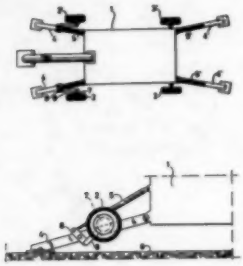
a support leg having a support surface engaging end and another end which is pivotally connected to the body member;

a piston-and-cylinder assembly operative between the support leg and the body member for raising the support leg from the support surface and lowering the support leg with its support surface engaging end in contact with the support surface;

a link-shaped member having a pair of opposed ends and

pivotally connected, intermediate its opposite ends, to the support leg and extending in a transverse direction relative to the support leg;

the piston-and-cylinder assembly being pivotally connected at its one end to the body member and pivotally connected at its other end to one end of the link-shaped member;



interconnection means for transferring movement between the other end of the link-shaped member and the wheel; and

the link-shaped member being pivotable between a first restricting position in which the wheel is in load-bearing contact with the support surface and a second restricting position in which the wheel is out of load-bearing contact with the support surface.

4,940,111

MOTORCYCLE

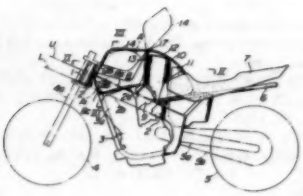
Yoshio Nogami, Okayama; Yoshihiro Matsuo, Saitama; Takayuki Fujii, Saitama, and Seiichi Urushi, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 18, 1988, Ser. No. 220,602

Claims priority, application Japan, Jul. 17, 1987, 62-177172; Jul. 20, 1987, 62-180642

Int. Cl.[5] B62B *61/02*

U.S. Cl. 180—219 **22 Claims**



1. A motorcycle comprising:

a head pipe;

a pair of laterally spaced main frames extending rearwardly from said head pipe;

a receptacle supported on said main frames;

said receptacle having a bottom wall positioned between said main frames, said bottom wall having at least a portion positioned below a plane including an upper surface of said main frames; and

said receptacle being shaped for storing a crash helmet therein.

4,940,112

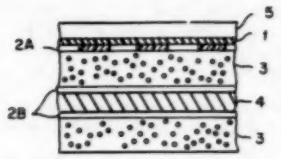
HIGH PERFORMANCE FLAME AND SMOKE FOAM-BARRIER-FOAM-FACING ACOUSTICAL COMPOSITE

Justin T. O'Neill, 185 Melba St., Unit 111, P.O. Box 175, Milford, Conn. 06460

Filed Jun. 20, 1989, Ser. No. 368,510

Int. Cl.[5] E04B *1/82*; C04B *43/00*; B32B *3/06, 5/32*

U.S. Cl. 181—290 **16 Claims**



1. A multilayered composite having improved flammability and smoke resistance properties comprising:

(a) a flame retardant flexible polyimide film facing layer,

(b) a first high temperature resistant silicone adhesive layer bonded to said polyimide film facing layer,

(c) a first open cell polyimide foam layer bonded to said first adhesive layer,

(d) a second high temperature resistant silicone adhesive layer bonded to said first open cell polyimide flame layer,

(e) a fire retardant flexible silicone sheet rubber layer bonded to said second adhesive layer,

(f) a third high temperature resistant silicone adhesive layer bonded to said silicone sheet rubber layer, and

(g) a second open cell polyimide foam layer bonded to said third adhesive layer.

4,940,113

METHOD OF ACOUSTICALLY INSULATING A TOILET BOWL

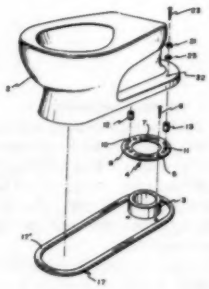
Ghislain L'Heureux, 911, rang St-Antoine, St Féréol Les Neiges, Quebec, Canada G0A 3R0

Filed Apr. 25, 1989, Ser. No. 342,907

Claims priority, application Canada, Dec. 8, 1988, 585333

Int. Cl.[5] F16F *15/00*

U.S. Cl. 181—296 **8 Claims**



1. A method of acoustically insulating a toilet bowl having a base resting on a building floor, comprising the steps of:

interposing a cushion of resilient, acoustically insulating material between the base of the toilet bowl and the said floor, so that the bowl base rests on the floor exclusively through the said cushion; and

attaching said base to the floor exclusively through at least

one fastener including a first rigid end, a second rigid end, and an intermediate link of resilient, acoustically insulating material, by attaching the first rigid end to the floor and the second rigid end to the base of the toilet bowl; whereby the toilet bowl and the floor are connected together through the cushion and the link both of resilient, acoustically insulating material, the said cushion and link preventing acoustic short circuits between the toilet bowl and the floor and transmission of acoustic vibrations from the toilet bowl to the building floor to thereby acoustically insulate the said bowl.

4,940,114

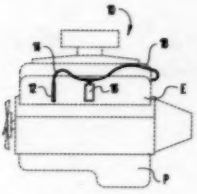
ENGINE PRELUBRICATING SYSTEM

Kenneth D. Albrecht, Box 2, Leader Sask., Canada S0N 1H0

Filed Sep. 5, 1989, Ser. No. 403,198

Int. Cl.[5] F01M *1/26*

U.S. Cl. 184—6.3 **7 Claims**



1. An engine prelubricating system for use with an internal combustion engine system including a block with internal oil passages, an oil sump, a dipstick well communicating with the sump, an electrically actuated starter motor and solenoid, a battery, and an ignition switch, comprising:

an oil intake tube dimensioned for insertion into the dipstick well;

said oil intake tube having a lower end portion provided with a graduated scale for measuring oil quantity in the sump;

handle means on an upper end portion of said intake tube for facilitating manual removal and replacement of said tube from the dipstick well;

an electric oil pump;

first conduit means connecting said oil intake tube to an inlet side of said oil pump;

quick release coupling means connecting said oil intake tube to said first conduit means;

second conduit means connecting an outlet side of said pump to the internal oil passages of the block;

first check valve means in said oil intake tube for preventing oil from flowing from said tube back into the sump;

second check valve means in said second conduit means for preventing oil from flowing from the block to said pump outlet side;

and

a pressure actuated switch connected in said second conduit means, said pressure actuated switch having a first low pressure position for connecting said electric pump to the battery when the ignition switch is closed and a second high pressure position for disconnecting the pump from the battery and for connecting the starter motor solenoid to the battery, whereby the engine cannot be started until a predetermined oil pressure is reached.

4,940,115

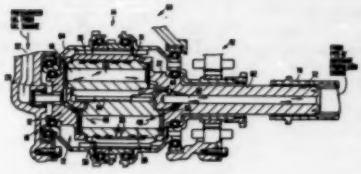
DIFFERENTIAL WITH BLEED HOLES FOR DEAERATION OF OIL FOR LUBRICATING JOURNALS

Kenneth B. Sugden, Rockford, Ill., assignor to Sundstrand Corporation, Rockford, Ill.

Filed Mar. 17, 1989, Ser. No. 324,751

Int. Cl.[5] F01M *9/10*

U.S. Cl. 184—6.12 **14 Claims**



1. A lubrication system comprising:

a source of pressurized oil;

a carrier, rotationally mounted on an axis of rotation, having an inlet for receiving pressurized oil from the source and an outlet for discharging a mixture of oil and air, and rotatably supporting a plurality of planetary gears as the carrier rotates;

a plurality of first ports, each first port being associated with a different planetary gear for supplying only oil to a journal rotatably supporting the planetary gear upon rotation of the carrier when pressurized oil is supplied to the inlet, each first port being disposed at a radial position on the carrier at a point displaced from the axis of rotation; and

deaerating means, in fluid communication with a mixture of air and oil moving radially outward from the axis of rotation during rotation of the carrier to each of the first ports, for removing air from the oil so that only oil moves radially outward to the first ports and for discharging a mixture of oil and air at the outlet.

4,940,116

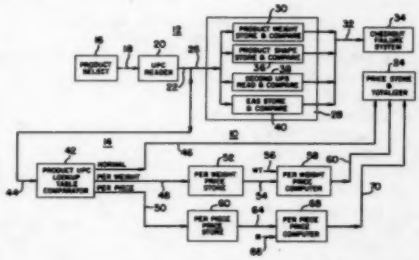
UNATTENDED CHECKOUT SYSTEM AND METHOD

David F. O'Connor, Delray Beach; Wesley Dickover, and Steven J. Tilidetzke, both of Coral Springs, all of Fla., assignors to Checkrobot Inc., Deerfield Beach, Fla.

Filed Mar. 7, 1989, Ser. No. 320,063

Int. Cl.[5] G06K *7/10*; G07C *11/00*

U.S. Cl. 186—61 **13 Claims**



1. In combination, in a system for operator-unassisted checkout of articles, inclusive of articles retailed by bulk weight and per piece pricing and bearing UPC indication thereon:

(a) reader means for reading article UPC indication and generating output signals indicative thereof;

(b) comparator means for receipt of said reader means output signals and for providing first and second separate output signals respectively indicating that

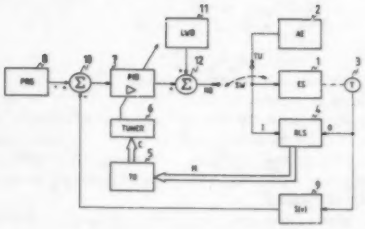
(1) the UPC indication in said reader means output signals is for an article retailed by bulk weight pricing, and
(2) the UPC indication in said reader means output signals is for an article retailed per piece pricing.

4,940,117

PROCEDURE FOR THE TUNING OF THE POSITION CONTROLLER OF AN ELEVATOR

Seppo Ovaska, Hyvinkaa, Finland, assignor to Kone Elevator GmbH, Switzerland

Filed Feb. 15, 1989, Ser. No. 310,129
Claims priority, application Finland, Feb. 16, 1988, 880724
Int. Cl.[5] B66B 1/34
U.S. Cl. 187—101 **10 Claims**



1. A procedure for tuning a position controller of an elevator drive system in an elevator system, wherein an artificial excitation signal is supplied to said position controller of said elevator drive system, the response corresponding to said artificial excitation signal is measured, a mathematical model of said elevator system is calculated, the behaviour of said elevator system is simulated, position control parameter values minimizing the difference between the values for target positions and the values for actual positions are calculated, individual differences in the vicinity of the ultimate target position are weighted by a large factor, said position control parameter values are reset to optimized values, a real excitation signal is input to said elevator drive system, said model parameter values are calculated again, and the above sequence of operations is repeated until said model parameter values and said control parameter values converge.

4,940,118

SLIP ASSEMBLY

Don C. Cox, Roanoke, Tex., assignor to Otis Engineering Corporation, Dallas, Tex.

Filed Oct. 31, 1988, Ser. No. 264,891
Int. Cl.[5] B23Q 5/033
U.S. Cl. 188—67 **21 Claims**

1. An hydraulically operated double acting slip assembly comprising:

(a) housing means including,

a lower plate with a connector thereon and a passage for pipe therethrough,

an upper plate,

a cover secured to said upper plate with a passage for pipe therethrough, and

ring segments between said plates around said pipe passages,

said segments connected to said plates;

(b) a pair of guide rods anchored in each said ring segment;

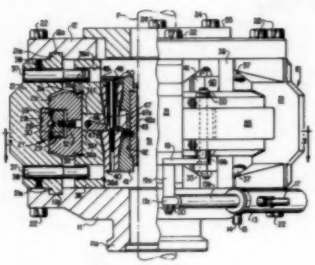
(c) pipe gripping means, slidaly mounted on said rods for gripping pipe passing through said passages including

double acting slip means for initially gripping pipe and increasing gripping force on gripped pipe ,said slip means automatically increasing gripping force on gripped pipe by load on gripped pipe causing more than about 0.70 inches upward or downward movement of pipe, said double acting slip means including a wedge slidably mounted on each pair of guide rods, said wedge having a "T" slot across the outer surface thereof, spaced apart upper and lower downwardly and inwardly inclined surfaces on the inner surface thereof and an opening between said "T" slot and said inner surface, said opening having a lower flat surface,

a secondary wedge having spaced apart upper and lower downwardly and inwardly inclined surfaces on the outer surface thereof, upper and lower downwardly and outwardly inclined surfaces on the inner surface thereof and an opening between said inner and outer surfaces, said opening having a lower flat surface,

slip means including a slip having spaced apart upper and lower downwardly and outwardly inclined surfaces and a recess on the outer face thereof, said recess having a lower flat surface,

means slidably connecting said secondary wedges to said wedges and said slips to said secondary wedges so that said outer secondary wedge surfaces slide on said wedge inner surfaces and said outer slip surfaces slide on said inner secondary wedge surfaces, said slidably



connecting means including pawls swivelably connected into each side of said wedges and slips, each said pawl having a flat surface,

cam plates connected to each side of said secondary wedges, said cam plates having inner and outer grooves, said flat surfaces on said wedge pawls slidable in said cam plate outer grooves and said flat surfaces on said slip pawls slidable in said cam plate inner grooves,

means preventing said secondary wedges from sliding upwardly on said wedges, means preventing said slips from sliding downwardly on said secondary wedges, and means for positioning each slip and secondary wedge in mid neutral position on each wedge;

(d) operating means slidably connected in said wedge "T" slots for moving said gripping means inwardly and outwardly along said guide rods to initially grip and upgrip pipe; and

(e) means preventing said operating means from moving the gripping means outwardly to a position not gripping pipe when said acting slip means are automaticlly increasing gripping force on gripped pipe.

4,940,119

DISC BRAKE ASSEMBLY

Toshio Kondo, Okazaki; Kenji Urata, Anjo; Masayoshi Katagiri, and Kenichi Nakamura, both of Toyota, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Nov. 30, 1988, Ser. No. 277,806
Claims priority, application Japan, Nov. 30, 1987, 62-303016; Mar. 31, 1988, 63-79926
Int. Cl.[5] F16D 55/00, 65/40, 65/38, 65/78
U.S. Cl. 188—73.31 **4 Claims**

1. A disc brake assembly for use with a disc rotor, comprising:

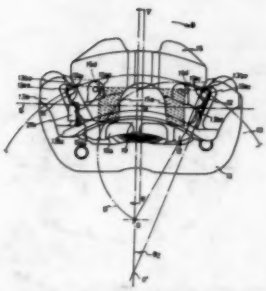
a mounting member including a pair of arms,

a pair of brake pad means being mounted on respective ones of the arms so as to be disposed on opposite sides of the rotor, the brake pad means being movable toward and away from the rotor, each brake pad means including a backing plate having first and second circumferential ends which converge generally radially inwardly,

guide means fixed in the mounting member and extending in an axial direction generally parallel to an axis of rotation of the rotor,

a caliper member slidably supported on the guide means for movement in the axial direction, the caliper member having a piston portion and a reaction portion disposed on opposite sides of the rotor and arranged to press respective brake pad means against opposite surfaces of the rotor,

the mounting member having two pairs of first and second torque-resisting surfaces arranged opposite associated pairs of the first and second circumferential ends of the backing plates and arranged to be contacted thereby during a braking operation to resist circumferential movement of the pair of brake pad means, each pair of torque



resisting surfaces being radially outwardly divergent such that the pair of brake pad means are guided for radial outward displacement during a braking operation,

generally circumferentially extending stop projections formed on the mounting member adjacent radially outer portions of the first and second circumferential ends of the backing plates for resisting the radial outward displacement of the associated brake pad means during a braking operation,

regulating means for locating a press center of each brake pad within a domain defined by a half circle whose arc extends from a center of rotation of the disc to a respective one of the stop projections, the regulating means comprising a shim disposed between a backing plate and the caliper member to form a gap between a radially outer portion of the caliper member and the backing plate,

circumferential ends of the backing plates including notches, the notches including generally radially extending supporting surfaces located at about the level of a radial center of the backing plate, and

springs mounted on the mounting member and engageable with the supporting surfaces for biasing the backing plates circumferentially.

4,940,120

DISC BRAKE, ESPECIALLY FOR USE WITH AUTOMOTIVE VEHICLES

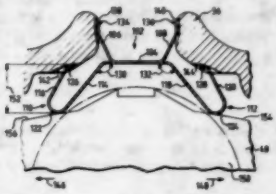
Bodo Schmidt, Lauterbach, and Helmut Krause, Kelkheim, assignors to Alfred Teves GmbH, Frankfurt, Fed. Rep. of Germany

Continuation of Ser. No. 169,529, Mar. 17, 1988, abandoned. This application Jun. 23, 1989, Ser. No. 371,684

Claims priority, application Fed. Rep. of Germany, Mar. 21, 1987, 3709396

Int. Cl.[5] F16D 65/02

U.S. Cl. 188—73.36 **3 Claims**



1. A disc brake for use with an automotive vehicle, comprising, in combination: a brake housing saddling the rim of a brake disc, brake pads located on either side of the brake disc, a spring supported on the brake housing and on the brake pads adapted to load the brake housing and the brake pads relative to one another, said spring including two circumferentially extending and spaced apart U-shaped spring arms with the base portion between the leg portions of each of said U-shaped spring arms being adapted to abut on a supporting face on the brake pad, another section of each of said spring arms of said spring adapted to abut on a supporting face formed on the brake housing wherein each of the spring arms forms an obtuse angle relative to a central section between said spring arms of said spring.

4,940,121

FLUID FRICTION CLUTCH

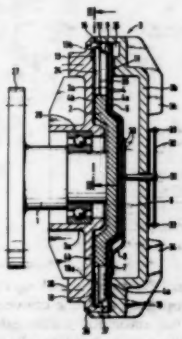
Jörg Digele, Freiberg, Fed. Rep. of Germany, assignor to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG, Fed. Rep. of Germany

Filed Jun. 6, 1988, Ser. No. 202,548

Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719279

Int. Cl.[5] F16D 31/00

U.S. Cl. 192—58 B **16 Claims**



1. A fluid friction clutch comprising:

a clutch disk which serves as a primary part and is connected firmly with a driven shaft for rotation about a clutch axis;

a housing that serves as a secondary part and has a working chamber narrowly surrounding the clutch disk and a storage chamber for the clutch fluid which is separated from this working chamber by a dividing wall; and

an inflow opening provided in the dividing wall which leads from the storage chamber to the working chamber, and is controllably opened or closed by means of a valve member;

wherein said chamber includes a front working chamber part formed between the clutch disk and the dividing wall and a rear working chamber part formed between a clutch disk and a rear wall of the housing,

wherein the front and rear working chamber parts are separated from one another by means of a sealing arrangement between the clutch disk and the housing,

wherein a first damming body means and a deflecting duct are provided for guiding flow of clutch fluid from the front working chamber part to the rear working chamber part,

wherein a surrounding flow duct is provided which surrounds the disks and rear working chamber part, said deflecting duct being connected with the surrounding flow duct,

wherein a second damming body means and a return flow duct are provided for guiding flow of clutch fluid from the rear working chamber part to the front working chamber part with respect to the disk,

and wherein said return flow duct is sealed off with respect to the deflecting duct and leads out into a return flow passage leading to the storage chamber, thereby facilitating flow of clutch fluid at both sides of the clutch disk even with low clutch fluid flow volumes through the inflow opening in the dividing wall.

4,940,122

SLIP CONTROL SYSTEM FOR TORQUE CONVERTER OF AUTOMATIC TRANSMISSION

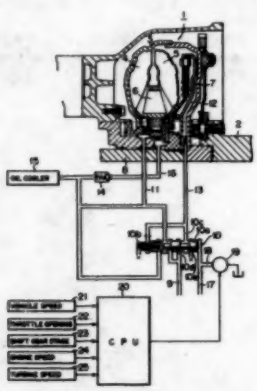
Fusao Fujieda, Hatsukaichi, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Feb. 14, 1989, Ser. No. 310,333

Claims priority, application Japan, Feb. 15, 1988, 63-32500

Int. Cl.[5] B60K *41/16*

U.S. Cl. 192—3.31 **13 Claims**



1. A slip control system of a lock-up clutch of an automatic transmission comprising a torque converter disposed between the engine and the automatic transmission for controlling an amount of a torque transmitted from the engine to the transmission, lock-up clutch means provided in the torque converter for connecting input and output members of the torque converter directly, slip control means for controlling an engaging force of the lock-up clutch means to establish a slip control in which a slippage is allowed between the input member and output member when a vehicle operating condition is in a predetermined slip control zone, transient control means for carrying out a transient control by setting a transient control factor to increase a change in the engaging force of the lock-up clutch means during a transient condition when the vehicle operating condition is changed between a non-slip control zone wherein the lock-up clutch is fully engaged or fully disengaged and said slip control zone, and the transient control factor being determined in accordance with the vehicle operating condition just before the vehicle operating condition falls into said slip control zone.

4,940,123

VISCOUS COUPLING

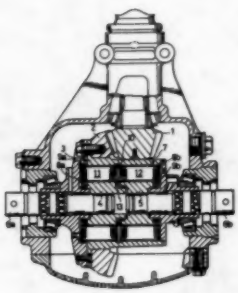
Masayuki Sayama, Tochigi, Japan, assignor to Viscodrive Japan Ltd., Japan

Filed Apr. 10, 1989, Ser. No. 335,425

Claims priority, application Japan, Apr. 11, 1988, 63-47758[U]

Int. Cl.[5] F16D *31/02*

U.S. Cl. 192—58 B **5 Claims**



1. A viscous coupling, comprising:

relatively rotatable first, second and third rotating members forming an operation chamber in which a viscous fluid is to be confined;

a dividing member placed inside the operation chamber for dividing the operation chamber into a first chamber formed by the dividing member and the first and third rotating members, and a second chamber formed by the dividing member and the second and third rotating members; and

pump means for controlling flow of the viscous fluid between the first and second chambers, said pump means being activated by a relative rotation of the first and second rotating members.

4,940,124

SPRING CLIP FOR PREVENTING CLUTCH PLATE FLUTTER

Raymond D. Galuska, Mt. Prospect, and Charles S. Murawski, Lindenhurst, both of Ill., assignors to Komatsu Dresser Company, Libertyville, Ill.

Filed Feb. 9, 1989, Ser. No. 309,278

Int. Cl.[5] F16D *13/52, 13/69*

U.S. Cl. 192—70.28 **21 Claims**

1. A spring clip adapted for attachment to a clutch plate of the type having an indention formed therein, said clip being effective to reduce flutter in a multiple clutch plate assembly, comprising:

a thin sheet of material having spring-like characteristics and

folded to define opposing engaging sections so that when applied to a peripheral edge of the clutch plate by pushing said clip onto a external peripheral edge of the plate toward a center thereof, opposing engaging surface of each said engaging section extend outwardly from respective friction side surfaces of associated friction pads, and a

fastening tab attached to said clip, having a free end extending inwardly and angled so that said clip can be pushed onto the eternal peripheral edge of said clutch plate and locked during installment thereof, but said angled tab engages the indention of said clutch plate and prevents removal of the clip during clutch operation.

4,940,125

DRIVE MECHANISM IN PART-TIME FOUR-WHEEL DRIVE VEHICLE

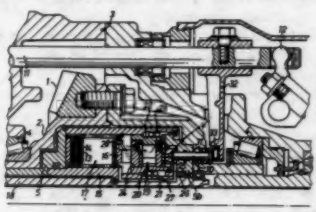
Kiyoomi Sato, Toyota; Fumihiro Ushijima, Okazaki, and Kiyohito Murata, Susono, all of Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Aichi, Japan

Filed Jan. 25, 1989, Ser. No. 301,105

Claims priority, application Japan, Jan. 25, 1988, 63-7926[U]

Int. Cl.[5] B60K *17/35*; F16D *25/14*

U.S. Cl. 192—85 AA **3 Claims**



1. A drive mechanism comprising driving and driven members coaxially coupled with each other for relative rotation, friction clutch means operatively associated with said driving and driven members and operable between a first condition wherein said driving and driven members are drivingly connected and a second condition wherein relative rotation between said driving and driven members is permitted, said clutch means including friction members cooperating with said driving and driven members and arranged to be engaged when said clutch means is in the first condition, a fluid pump arranged between said driving and driven members to be driven by relative rotation therebetween, said fluid pump being located adjacent one side of said clucth means and axially movable in a direction to effect a frictional pressure engagement of said friction members when applied at one side thereof with a discharge pressure thereof, and a flow control valve disposed in a communication passage for fluid circulation between discharge and suction ports of said fluid pump to control an amount of fluid under pressure passing therethrough from the discharge port toward the suction port;

wherein said flow control valve includes an axially displaceable valve element disposed in said communication passage and shiftable between a first position in which it is retained to fully open said communication passage and and second position in which it is retained to close said communication passage for interrupting the flow of fluid under pressure from the discharger port of said pump, and wherein a shift mechanism is adapted to shift said valve element to and from the second position.

4,940,126

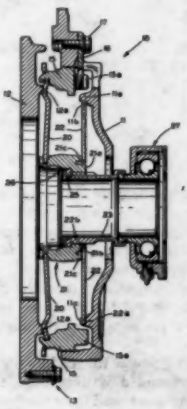
DIAPHRAGM SPRING CLUTCH

Richard A. Flotow, Butler; William H. Sink, Auburn, and Martin J. Hermanns, Ft. Wayne, all of Ind., assignors to Dana Corporation, Toledo, Ohio

Filed Mar. 11, 1988, Ser. No. 166,862

Int. Cl.[5] F16D *13/44*

U.S. Cl. 192—89 B **6 Claims**



1. A cover assembly for a diaphragm spring clutch comprising:

a cover having an annular shoulder and a slot formed through said shoulder;

a release retainer having an end surface and a recessed area formed into said end surface; and

diaphragm spring means including an inner peripheral surface engaged with said end surface of said release retainer, an outer peripheral surface engaged with said shoulder of said cover, and at least one tang extending from each of said inner and outer peripheral surfaces, said inner tang extending into said recessed area of said release retainer and said outer tang extending into said slot of said cover for preventing relative rotational movement between said diaphragm spring, said release retainer, and said cover.

4,940,127

WOUND YARN PACKAGE TRANSPORTING SYSTEM

Shuichi Kikuchi, Shiga, and Yoshihiko Kawasaki, Kyoto, both of Japan, assignors to Murata Kikai Kabushiki Kaisha, Kyoto, Japan

Filed Dec. 9, 1987, Ser. No. 130,307

Claims priority, application Japan, Dec. 12, 1986, 61-296429; Dec. 23, 1986, 61-198052[U]; Dec. 25, 1986, 61-202559[U]

Int. Cl.[5] B65G *47/48*

U.S. Cl. 198—350 **9 Claims**

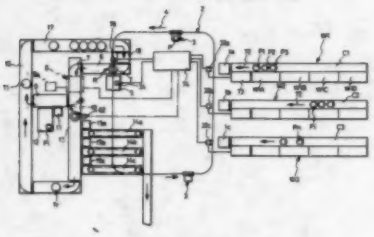
1. In a system for transporting a yarn package wound by a winder, the improvement comprising package transporting apparatus, comprising:

transport media for independently transporting packages thereon and for being fed along a transport line between a winder and an inspecting station,

wherein said transport media comprise a hanger hung on a chain which travels along a track and a tray which carries a package erected thereon and is transported on a conveyor,

wherein said hanger and said tray are provided with a source indicating member which indicates a source of a package which is to be placed on the respective hanger or tray, and a device for writing on or reading from said indicating members is arranged at a suitable location of said transport line in order to identify a source of each package,

wherein said hanger has at least one pair of package supporting rods which extend in a direction substantially parallel to the direction of movement of said hanger and are



spaced by a predetermined distance from each other, whereby a package is transported in a condition wherein an outer peripheral surface of a layer of yarn on the package is placed on said supporting rods,

wherein a full wound package doffed from a winder is transferred by the hanger and then the package is unloaded from the hanger and fitted on and erected on a tray for transporting a package at a position of an unloading device,

wherein a reading device for reading the identifying member of the hanger and a writing device to write the same identifying marks as read from the hanger on the identifying information indicating member of the tray are provided at the position of the unloading device.

4,940,128

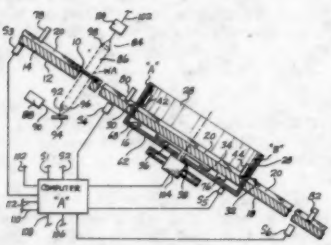
ARTICLE ORIENTATION SYSTEM AND METHOD

Robert L. Fuller, Jr., Issaquah; Paul E. Faville, and Mark C. Maier, both of Renton, all of Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Nov. 10, 1988, Ser. No. 270,251

Int. Cl.[5] B65G *47/244*

U.S. Cl. 198—395 **10 Claims**



1. An article orientation mechanism, comprising:

an elongated, rotatable conveyor section mounted for rotation about an axis extending perpendicular to said conveyor section, said conveyor section including a longitudinal slideway section along which articles slide in succession, and a gate at each of its ends, said gates being rotatable with the rotatable conveyor section, each gate having an open position and a closed position;

a lead-in conveyor section including a slideway section for delivering an article to the slideway section of the rotatable conveyor section;

a lead-out conveyor section including a slideway section for receiving an article from the slideway section of the rotating conveyor section and conveying it away from said rotating conveyor section;

said lead-in conveyor section, said rotatable conveyor section and said lead-out conveyor section being normally positioned with their slideways sections in linear alignment with each other; and

a drive for reversibly rotating the rotatable conveyor section 180° in position.

4,940,129

APPARATUS FOR REGROUPING ARTICLES FROM A FIRST CONVEYOR TO A SECOND CONVEYOR

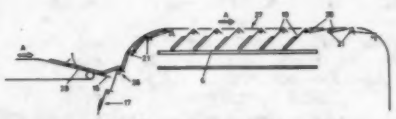
Theo Walz, Neunkirch, Switzerland, assignor to SIG Schweizerische Industrie-Gesellschaft, Neuhausen am Rheinfall, Switzerland

Filed Apr. 7, 1989, Ser. No. 334,542

Claims priority, application Switzerland, Apr. 29, 1988, 1604/88

Int. Cl.[5] B65G *47/40*

U.S. Cl. 198—418.6 **11 Claims**



1. A conveyor apparatus for regrouping articles from parallel-arranged first columns to form parallel-arranged second columns, wherein each second column contains an article from every first column, comprising

(a) a first conveyor moving in a first direction of advance and carrying the first columns of articles; said first conveyor having a discharge end;

(b) two horizontally spaced endless carrier elements arranged to circulate in a closed path having an ascending zone extending upwardly and away from said discharge end of said first conveyor and a horizontal zone adjoining an upper end of said ascending zone;

(c) consecutively arranged elongate article support members extending between the two carrier elements transversely thereto and each having opposite ends pivotally supported by respective said carrier elements to be advanced thereby through said ascending and horizontal zones; each said article support member comprising an elongate plate having a longitudinal leading edge; each said plate being pivotal relative to said carrier elements at opposite ends of said leading edge about a horizontal pivot axis;

(d) transferring means for moving the articles from said discharge end of said first conveyor onto said article support members as said article support members travel sequentially past said discharge end;

(e) actuating means for pivoting said article support members into a first pivotal position to support articles in said ascending zone and for pivoting approximately simultaneously a plurality of said article support members in said horizontal zone into a second pivotal position in which the article support members are inclined such as to cause the articles to slide off therefrom; the number of said plurality of article support members pivoted substantially simultaneously corresponds to the number of said second columns; said actuating means comprising

(1) a guide roller mounted for rotation on at least one side

of each said plate at a distance from a respective said horizontal pivot axis;

(2) a first guide rail extending in the travelling direction of the plates and being supported in said horizontal zone; each said roller being arranged to run on a track face of said first guide rail; said track face of said first guide rail having linear portions and a plurality of depressions;

(3) a second guide rail extending alongside said first guide rail and having a throughout linear track face; said second guide rail having an operative position in which the track face of the second guide rail extends alongside the depressions in alignment with the linear portions of the track face of the first guide rail for engaging each roller in zones of said depressions, whereby the rollers are prevented from dipping into the depressions; said second guide rail having a withdrawn position in which the track face of the second guide rail is moved away from said depressions allowing each roller to run on the depressions of the rack face of the second guide rail, whereby each roller dips in the zone of the depressions from a linear course, causing the respective plates to pivot from the first pivotal position into the second pivotal position; and

(4) an actuating element connected to said second guide rail for selectively moving said second guide rail into said operative and withdrawn positions;

(f) a second conveyor extending below said article support members situated in said horizontal zone of said carrier elements; said second conveyor being moved in a second direction parallel to said article support members and perpendicular to said first direction, whereby the articles sliding off said article support members in the second pivotal position thereof drop onto said second conveyor to form said second columns thereon; and

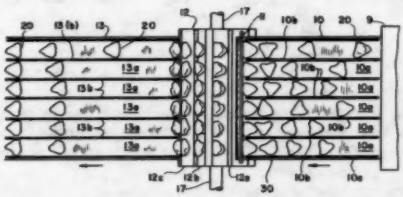
(g) an abutment situated between each adjoining said article support member and extending away therefrom to a predetermined height; each said abutment travelling with said article support members and being arranged to abut a trailing edge of an article supported on a respective said article support member when in said first pivotal position; said depressions being spaced from one another at a distance corresponding to a distance between two consecutive said abutments.

4,940,130

METHOD OF CONTROLLING THE FLOW OF BAKERY AND OTHER ITEMS

Agostino Aquino, Patterson, N.J., and Karl U. Lang, Port Jarvis, N.Y., assignors to Nabisco Brands, Inc., East Hanover, N.J.

Filed Nov. 30, 1988, Ser. No. 277,768
Int. Cl.[5] B65G *47/52*
U.S. Cl. 198—432 **31 Claims**



1. A method of controlling the flow of items in a conveyor system, comprising:

conveying said items by a first conveyor having a plurality of lanes to a rotating drum positioned transversely relative to said first conveyor and having a plurality of longitudinal transverse peripheral grooves with ledge portions;

holding said items at an end of each lane of said first conveyor until there is positioned an item in each lane to define a transverse row of items;

releasing and transferring the transverse row of items to said rotating drum so that said items are caught by said ledge portions as the grooves are being rotated upwardly as the drum rotates;

rotating said drum to a position at which said items can be removed from said grooves; and

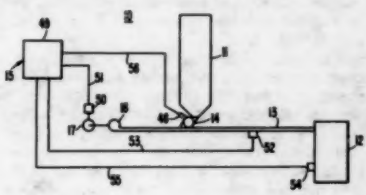
depositing said items from said grooves onto a second conveyor.

4,940,131

MATERIAL HANDLING SYSTEM AND CONTROL VALVE THEREOF

Roy Swartz, Muncy, Pa., assignor to Delaware Investments, Inc., Wilmington, Del.

Continuation of Ser. No. 192,916, May 12, 1988, abandoned. This application Nov. 16, 1989, Ser. No. 437,298
Int. Cl.[5] B65G *31/04*
U.S. Cl. 198—524 **8 Claims**



1. A rotary valve adapted for use in a particulate material handling system having an elevated means for holding a supply of said particulate material, a lower material receiving means and a remote control means, comprising:

a housing having a rotor chamber, a side inlet communicating with said rotor chamber and communicable with said material holding means and a lower outlet communicating with said rotor chamber and communicable with said material receiving means;

a rotor journalled in said rotor chamber having a plurality of radially disposed vanes defining a plurality of circumferentially spaced pockets registrable with said side inlet and lower outlet;

means for driving said rotor whereby each of said pockets will register with said inlet to receive therein material gravity fed through said inlet, rotate through said rotor chamber and register with said outlet to discharge material therefrom;

a slide valve disposed in said inlet for controlling the flow of material therethrough;

said side inlet having a lower material guiding wall disposed at an angle of 45° relative to a plane passing through the axis of rotation of said rotor;

said slide valve being displaceable in a plane disposed tangentially relative to a vane of said rotor and normal to said lower material guiding wall of said side inlet; and

means operatively connectable to said remote control means for operating said slide valve whereby when said remote control means is operated said side valve operating means will function to displace and said slide valve relative to said material guiding wall to correspondingly control the flow of material from said inlet into the pockets of said rotor and through said valve, said remote control means connected to sensing devices for sensing operating conditions of said material handling system, and said slide valve being operated in response to said sensed conditions.

4,940,132

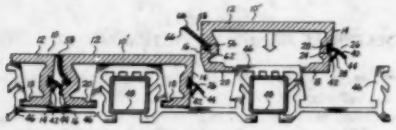
SEALS FOR RECIPROCATING CONVEYOR FLOOR MEMBERS

Raymond K. Foster, P.O. Box 1, Madras, Oreg. 97741

Continuation-in-part of Ser. No. 185,840, Apr. 25, 1988, Pat. No. 4,858,748, which is a division of Ser. No. 59,376, Jun. 4, 1987, Pat. No. 4,785,929, which is a continuation-in-part of Ser. No. 680,069, Dec. 10, 1984, Pat. No. 4,679,686, which is a continuation-in-part of Ser. No. 346,865, Feb. 8, 1982, Pat. No. 4,492,303. This application May 3, 1989, Ser. No. 346,784

Int. Cl.[5] B65G *25/00*

U.S. Cl. 198—750 12 Claims



1. A reciprocating floor conveyor, comprising:

a plurality of adjacent elongated floor members, each floor member having first and second sides, said first side of each floor member including a longitudinal dovetail groove; and

a resiliently bendable elongated elastomeric seal for each floor member, said seal having an inboard base portion captured within the dovetail groove and an outboard portion, said outboard portion including a branch strip outwardly and downwardly extending from said inboard portion, said branch strip having a free edge positioned to contiguously contact a confronting surface of an adjacent floor member such that said reciprocating floor conveyor is substantially nonporous to upward movement of material between said adjacent floor members and having a stiff resiliency urging said free edge toward the confronting surface.

4,940,133

CONVEYOR BELT AND SYSTEM WITH A NON-COLLAPSING INSIDE EDGE

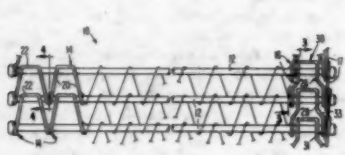
Gerald C. Roinestad, and Michael R. Straight, both of Winchester, Va., assignors to Ashworth Bros., Inc., Fall River, Mass.

Continuation-in-part of Ser. No. 171,390, Mar. 21, 1988, Pat. No. 4,867,301, which is a continuation-in-part of Ser. No. 83,272, Aug. 10, 1987, abandoned, and a continuation-in-part of Ser. No. 213,171, Jun. 29, 1988. This application Jul. 27, 1988, Ser. No. 224,696

The portion of the term of this patent subsequent to Sep. 19, 2006, has been disclaimed.

Int. Cl.[5] B65G *15/02*

U.S. Cl. 198—831 16 Claims



1. A conveyor belt for conveying in both a straight line direction and around lateral curves in a single direction, the lateral curves having a predetermined maximum curvature with a predetermined radius of curvature, the conveyor belt comprising a plurality of rods and connecting means for connecting said rods to form a length of the belt, said rods extending transversely of the length of the belt between an inside end along the inside edge of the lateral curves and an outside end along the outside edge of the lateral curves, said rods being arranged adjacent one another longitudinally along the length of the belt, said connecting means including link means disposed adjacent said inside and outside ends of said rods for coupling adjacent pairs of said rods to one another, said link means including, along the inside concave edge of the belt, at least two generally U-shaped inside links joining the inside ends of each pair of adjacent rods and, along the outside convex edge of the belt, at least one outside link joining the outside ends of each pair of adjacent rods, said generally U-shaped inside links each having a pair of spaced leg portions joined by a connecting portion, each of said leg portions having holes for receiving said rods, each of said outside links having holes for receiving said rods, said holes in the legs of said inside links having end surfaces with a first predetermined longitudinal spacing, said holes in said outside links having end surfaces with a second predetermined longitudinal spacing, said first and second longitudinal spacings being correlated to one another and to the predetermined radius of curvature so that in straight line conveying motion the inside ends of said rods are kept at a first pitch and the U-shaped inside links are tractive while the outside links are non-tractive, and during lateral curved conveying motion the inside ends of said rods are kept at substantially the first pitch and at least one of said U-shaped inside links remains tractive while the outside ends of said rods move to a second greater pitch.

4,940,134

WASTE SOLUTION TREATMENT METHOD AND APPARATUS THEREFOR

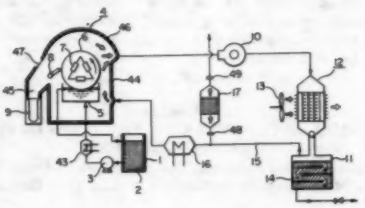
Syuzo Aoki; Satoru Kuse, both of Hino, and Shigeharu Koboshi, Sagamihara, all of Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 32,633, Apr. 1, 1987, abandoned. This application Nov. 14, 1988, Ser. No. 271,383

Claims priority, application Japan, Apr. 4, 1986, 61-78885

Int. Cl.[5] B01D *3/08, 3/42*

U.S. Cl. 202—202 3 Claims



1. A waste liquid treatment apparatus for treating waste solutions resulting from photographic processing comprising:

evaporation means including a continuous enclosure means having an interior portion sealed by said enclosure means from communication with the ambient, and heating means for heating the waste solution to its evaporation point to form waste vapor;

a waste solution reservoir disposed in said interior portion of said enclosure means, for containing waste solution;

means for maintaining the waste solution in the reservoir at a constant level;

means for supplying said waste solution reservoir with waste solution;

the waste solution reservoir being located in said interior and sealed from the ambient to contain any offensive odors and toxic gases generated thereby;

condenser means for condensing the waste vapor to form waste condensate, said condenser means including a drain tank for collecting waste condensate, said drain tank having an interior portion, vent means in communication with said drain tank for exhausting a non-condensable gas component of said waste vapor from the interior portion of

said drain tank, said vent means including gas treatment means for treating the non-condensable gas component, the gas treatment means including means for regulating the pressure of the interior portion of the enclosure means to establish a pressure differential between the pressure of the interior portion of the enclosure means and ambient pressure;

communication means for placing said condenser means in communication with said interior portion of said enclosure means; and

an air vent line for placing said vent means in communication with said gas treatment means, said air vent line having a branch line extending from a branch point between said drain tank and said gas treatment means, said branch line being connected to said enclosure means to place said drain tank in communication with said enclosure means.

4,940,135

CARTRIDGE HOLDER

Dennis C. Hall, Rte. 1, Box 625, Duncanville, Ala. 35456

Filed Oct. 5, 1989, Ser. No. 417,307
Int. Cl.[5] B25C *1/00*
U.S. Cl. 206—3 4 Claims

1. A cartridge holder for carrying firearm cartridges, comprising:

an elongated cylindrical tube having opposite open ends;

a plurality of firearm cartridges stacked in front end to rear end coaxial relation within said tube;

a removable cap at each of said opposite open ends of said tube;

each of said removable caps including a generally cylindrical rubber body having a reduced diameter stem dimensioned for insertion into and frictional engagement with an open end of said tube, said reduced diameter stem of each of said caps providing a shock absorbing end face for abutment with an end of a firearm cartridge;

an exterior radial flange on each of said caps having a diameter greater than an external diameter of said tube;

a plurality of frusto conical flanges stepped along said stem of each of said caps; and

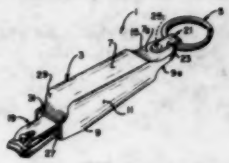
indicia on an external surface of said tube indicating a forward facing direction of said firearm cartridges, whereby a selected one of said removable caps may be removed to load a forwardly or rearwardly opening firearm magazine.

4,940,136

FINGERNAIL CLIPPER POUCH

Joseph T. Miller, Melville, and Edward F. Brown, Bonne Terre, both of Mo., assignors to Mocap, St. Louis, Mo.

Filed Jul. 3, 1989, Ser. No. 375,342
Int. Cl.[5] A45D *29/00*; A45C *15/00*
U.S. Cl. 206—38.1 12 Claims



1. A fingernail clipper pouch comprising an integral one-piece receptacle constructed of resilient and flexible material, said receptacle having an elongated shape with opposed ends and an interior compartment generally configured to the shape of a fingernail clipper adapted to be received therein, one end of said receptacle being closed and the other being open for entry and removal of the fingernail clipper associated therewith, and said open end having a restricted throat opening to restrict unauthorized removal of the fingernail clipper from said receptacle, said pouch entirely enclosing the clipper along its entire length when inserted therein.

4,940,137

COASTER CARRIER

Albert H. Straub, 13060 Skyline Blvd., Woodside, Calif. 94062

Continuation-in-part of Ser. No. 932,451, Nov. 18, 1986, abandoned. This application Mar. 25, 1988, Ser. No. 178,765
Int. Cl.[5] B65D *25/20, 25/22, 25/24*
U.S. Cl. 206—139 28 Claims

1. A coaster for a beverage container having generally cylindrical shape and a lateral projection free bottom end, which comprises an open ended ring having a side extending parallel to an axis of said ring, a plurality of projections and a plurality of recesses on an outer surface of said ring parallel to the axis, said plurality of projections and said plurality of recesses being configured and positioned to engage corresponding recesses and projections in interlocking engagement fastening said plurality of projections and recesses and the corresponding projections and recesses together, said ring having a plurality of resilient ribs on an inside surface of said ring, said ring having a width which is narrow when compared with a height of the beverage container, being dimensioned to fit around the beverage container in a friction fit in a location spaced from a bottom end of the beverage container and having sufficient rigidity to support the beverage container above a horizontal supporting surface when said ring is slid along the beverage container from the position spaced from the lateral projection free bottom end of the beverage container so that said ring extends partially beyond the lateral projection free bottom end of the beverage container, the friction of the friction fit and the width of said ring being sufficient to hold said ring at the lateral projection free bottom end of the beverage container and

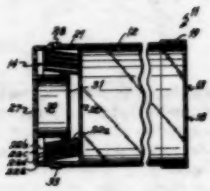
extending partially beyond the lateral projection free bottom end of the beverage container, the friction of the friction fit further being such that said ring may be slid by hand along the beverage container.

4,940,138

CONTAINER WITH COLLAPSIBLE CUP

Allan S. Hornstein, Matawan, N.J., assignor to Queen City Group, Cincinnati, Ohio

Filed Jan. 30, 1990, Ser. No. 472,092
Int. Cl.[5] B65D 77/00, 8/14
U.S. Cl. 206—218 **7 Claims**



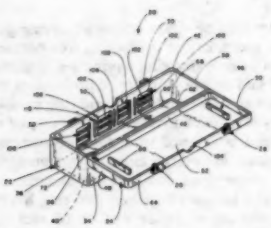
1. A storage container comprising:
a tube having a side wall and first and second end openings;
a closure for said first end opening;
a collapsible cup comprising a base with a rim, a series of annular cup segments of graduated diameters which are extendible to form a cup, the segment of smallest diameter being joined to said base, the segments being collapsible onto said base around the smallest segment, inwardly of said rim; and
a cover for said cup, said cover having a skirt which removably fits onto said rim of said base of said cup when said cup is collapsed, one of said rim and skirt being sized to frictionally fit within said second opening to form a removable closure for said second opening.

4,940,139

MOP HEAD CONTAINER

Jean Sandt, 402 King St., E. Stroudsburg, Pa. 18301

Filed Oct. 17, 1989, Ser. No. 422,521
Int. Cl.[5] A45D 44/18
U.S. Cl. 206—362.2 **5 Claims**



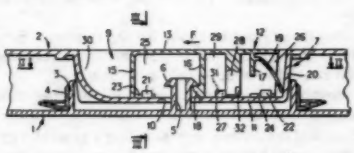
1. A container for a mop head comprising:
(A) a rectangular case bottom portion having first and second end walls, first and second side walls and a bottom connected to said end and side walls;
(B) a rectangular top portion having end walls, side walls and a top connected to said end and side walls;
(C) a hinge means pivotally connecting said top portion to said bottom portion;
(D) vent means on said first side wall of said bottom portion and including a plurality of vent passage groups, said vent passage groups being spaced apart from each other and each including a plurality of spaced-apart vent openings;
(E) a drainage system in said case bottom and including
(1) two longitudinal troughs defined in said case bottom and extending beside said first and second side walls and from said first end wall to said second end wall, each longitudinal trough having a center section that is elevated with respect to the sections thereof to slope from said center section to said end sections,
(2) two transverse troughs defined in said case bottom and extending beside said first and second end walls and from said first side wall to said second side wall and having a center section that is elevated with respect to the sections thereof to slope from said center section to said end sections,
(3) drain holes in the end sections of said troughs, and
(4) a fluid catching compartment mounted on the bottom to depend therebeneath, said fluid catching compartment including a bottom, side walls connected to said first and second side walls, end walls connected to said first and second end walls and a door hingedably connected to one of said compartment end walls, and
(5) said drain holes fluidically connecting said troughs to said fluid catching compartment;
(F) said bottom being spherically shaped and curving to be convex with respect to said top and having a crown portion in the center and sloping continuously towards said longitudinal and transverse troughs;
(G) a desiccant and fluid deodorizing material in said fluid catching compartment;
(H) mop squeezing means on said top and including projections mounted on said top to extend toward said bottom when said top portion is in covering relation with said bottom portion, said projections being sized to contact a mop head which is located in said bottom portion and force such mop head against said bottom when said top portion is closed against said case bottom portion; and
(I) lock means on said bottom and top portions to lock said top portion to said bottom portion.

4,940,140

CASE FOR CONTAINING AND IMMOBILIZING A COMPUTER TAPE REEL

Patrick Posso, Pully, Switzerland, assignor to Gefitec S.A., Switzerland

Filed Oct. 6, 1989, Ser. No. 418,082
Claims priority, application France, Oct. 10, 1988, 88 13285
Int. Cl.[5] G11B 23/27; B65D 45/00, 85/57
U.S. Cl. 206—405 **1 Claim**



1. A case for containing a computer tape reel comprising:
a lower body having an integrally molded central post and a concentric sleeve;
a cover closing the lower body and enclosing said computer tape reel, wherein said computer tape reel is centered on a single immobilizing ring surrounding said concentric sleeve; said cover having a central dish, adapted to fit in said sleeve of said body and formed with an opening surrounding said post, said central dish having a guidable housing adapted to engage said post, said guidable housing comprising:

an intermediate bar, extending perpendicularly from said guidable housing and engaging said post;

a spring means having an integral leaf spring contacting said housing and providing slidable spring engagement of said intermediate bar with said post, said case having means for guiding said intermediate bar from an open position to a closed position in order to slidably disengage or engage said post; said spring means further comprising a flexible stop which is deformable in a plane perpendicular to the direction in which the housing is moved, said stop adapted to cooperate with a lug formed on said dish, said stop and lug having inclined raps to facilitate assembly and prevent retraction of said stop during assembly of said cover thereby rendering said intermediate bar captive of said cover.

4,940,141

SHRINKWRAP BEVERAGE PACK

Terry Philpot, 1532, Chemong Road, R.R.1. Peterborough, Ontario, K9J 6X3, Canada

Continuation-in-part of Ser. No. 299,554, Jan. 17, 1989. This application Apr. 28, 1989, Ser. No. 344,749

Int. Cl.[5] B65D *75/00*

U.S. Cl. 206—430 **8 Claims**

1. A carrier and package assembly for a plurality of cylindrical articles, such as cans, and comprising:

(a) a plurality of articles arranged end to end in longitudinally extending and axially aligned groups, said groups being arranged in pairs with their longitudinal axes as being substantially parallel to each other;

(b) an open ended heat shrunk plastic film envelope means operatively, separately and tightly engaging each one of a pair of groups; and

(c) handle means integrally formed by a loop of said plastic film interconnecting the groups of each said pair of groups.

4,940,142

DEVICE FOR STORING DATA DISKETTES IN FILE FOLDERS

Dietmar Behrens, Dusseldorf; Waldemar Hoog, and Rudolf Zimmermann, both of Wuppertal, all of Fed. Rep. of Germany, assignors to Elba-Ordner-Fabrik Kraut & Meinenborn GmbH & Co., Fed. Rep. of Germany

Division of Ser. No. 180,363, Apr. 11, 1988, Pat. No. 4,884,691. This application Nov. 3, 1989, Ser. No. 431,436

Claims priority, application Fed. Rep. of Germany, Apr. 15, 1987, 3712803

Int. Cl.[5] B65D *85/30*; B42F *5/00*

U.S. Cl. 206—444 **12 Claims**

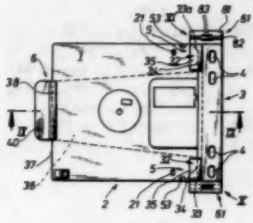
1. Device for storing data diskettes in records and files such as folders or the like, comprising:

a flat holder part (2) for one planar diskette (1);

a binder margin (3) provided on one side edge of said holder part (2) said binder margin (3) having binder holes (4);

said holder part (2) having a receptacle (5) for securing the diskette (1) in the direction of the three side edges thereof as well as in a direction perpendicular to the plane of the diskette (1);

said receptacle (5) having an insertion opening on one side for insertion of the diskette (1) at one edge thereof into said receptacle (5) and for removal of the diskette (1), respectively, substantially in the direction of the diskette plane;



said holder part (2) together with said binder margin (3) forming a one-piece molded plastic part;

said binder margin (3) being opposite said insertion opening and extending along said one side edge of the holder part (2) transversely to the direction of insertion of the diskette (1); and

said holder part (2) further having holding means (6) reaching around the diskette (1) on a free end edge thereof opposite said one edge of the diskette (1) for holding the diskette (1) in said receptacle (5).

4,940,143

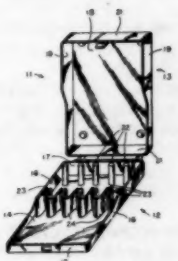
FLATWARE CASE HAVING CLAMPING MEANS

John Stanfield, 425 Riverhill Dr., Atlanta, Ga. 30328

Filed Apr. 17, 1989, Ser. No. 342,737

Int. Cl.[5] B65D *1/34*; A45C *11/00*

U.S. Cl. 206—553 **3 Claims**



1. A case for storing and carrying flatware of the type having stems extending from utility ends and with said case comprising:

a base having a floor bounded by two end walls and two side walls;

at least one pair of spaced posts mounted to said base floor closely adjacent to one of said end walls along a line extending generally parallel to said one end wall;

at least one pair of spaced pegs mounted to said base floor between said at least one pair of spaced posts and the other of said end walls along a line extending generally parallel to said one end wall, and

a clamping means for clamping flatware mounted to said at least one pair of pegs with said clamping means including a pair of resilient arm spring biased towards mutual engagement of a point of engagement located along a line extending linearly between said at least one pair of pegs and said at least one pair of posts,

whereby a stack of flatware may be positioned upon the base floor with the stems of the flatware releasibly held by the clamping means and with the utility ends of the flatware captured between the at least one pair of posts.

4,940,144

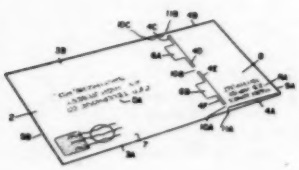
AUTOMATIC ENVELOPE OPENER AND ENVELOPE FOR USE THEREWITH

William P. Barbour, 8021 Nicky Ct., Laurel, Md. 20707

Division of Ser. No. 278,495, Dec. 1, 1988. This application Jun. 7, 1989, Ser. No. 363,479

Int. Cl.[5] B65D *27/34, 27/36*

U.S. Cl. 206—610 **18 Claims**



1. An envelope for use in conjunction with an automatic envelope opener, said envelope comprising:

a first wall defined by top and bottom fold lines and at least one side fold line;

said top fold line including a top fold line weakened portion and said bottom fold line including a bottom fold line weakened portion;

said first wall including:

a plurality of first wall weakened portions;

a first connecting member defined by said top fold line weakened portion and one of said first wall weakened portions;

a second connecting member defined by said bottom fold line weakened portion and another one of said first wall weakened portions;

said weakened portions being comprised of continuous knife slit portions of a predetermined length; and

at least two apertures disposed in said first wall between a plurality of said first wall weakened portions.

4,940,145

APPARATUS FOR SIZING PRODUCE AND THE LIKE

Max M. Bibby, 6826 Labish Center Rd. NE., Salem, Oreg. 97305

Filed Oct. 7, 1985, Ser. No. 785,017

Int. Cl.[5] B07B *13/04*

U.S. Cl. 209—662 **4 Claims**

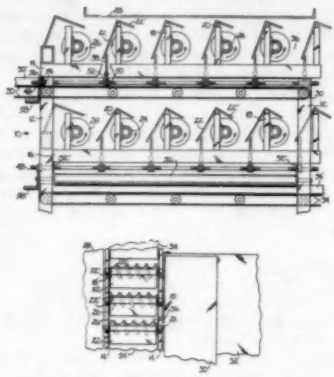
1. A sizing apparatus for produce comprising:

(a) a vertically extending framework,

(b) at least one substantially horizontal sizing level base mounted on the framework,

(c) a plurality of rotary driven screw conveyors on said sizing level base arranged in longitudinally extending condition and disposed at laterally spaced apart intervals, each said screw conveyor configured with a thread having a substantially semi-circular profile betwen crests, and

(d) a sizer blade mounted adjacent each said rotary driven screw conveyor and disposed to establish a sizing opening between it and its associated screw, the openings being of uniform size on a level whereby to allow produce and the



like of smaller diameter to fall downwardly therethrough by gravity.

4,940,146

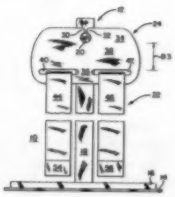
HANGER AND DISPLAY ARRANGEMENT FOR SUSPENDERS

Chester Kolton, Westfield, and Stuart S. Spater, Livingston, both of N.J., assignors to B & G Plastics, Inc., New York, N.Y.

Filed Dec. 5, 1988, Ser. No. 279,992

Int. Cl.[5] A47F *7/00*

U.S. Cl. 211—13 **10 Claims**



1. A countertop suspenders display arrangement including:

(a) a countertop stand having a base, a display rod and a support extending upstandingly from said base and supporting said display rod at a given distance from said base;

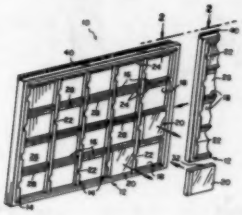
(b) suspenders having straps with end fittings, the full longitudinal extent of said suspenders being substantially in excess of said given distance; and

(c) a suspenders hanger supported by said display rod and configured as a resilient, flat body of synthetic material, said body having

(1) an upper portion defining a recessed opening about which the body is deflectable to receive the display rod and to self-biasingly resume an undeflected state to releasably ensnare the display rod, and

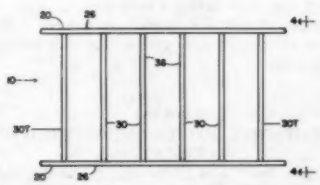
(2) a lower portion, spaced from the upper portion and including first and second laterally extending recessed openings of measure equal to or exceeding the width of said suspenders straps and first and second slots extending from a lower perimeter of said body into respective communication with said first and second lower portion openings, said body being deflectable about each of said slots to receive said straps and to self-biasingly resume an undeflected state to releasably ensnare said straps, said straps being so disposed in said first and second lower portion openings that said end fittings of said straps collectively reside in spaced relation to said base.

4,940,147
VISUAL COMPACT DISK WALL RACK
Douglas J. Hunt, 105 Lone Oak Path, Smithtown, N.Y. 11787
Filed Feb. 17, 1989, Ser. No. 311,989
Int. Cl.[5] H47F 5/08
U.S. Cl. 211—40 **3 Claims**



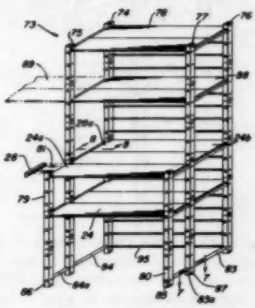
1. A visual compact disc wall rack for removably storing compact music disc cases which comprises:
(a) a frame having two vertical members and two horizontal members;
(b) at least one additional vertical member equally spaced apart from each of the said two vertical members and fixedly secured at each end to said horizontal members of said frame;
(c) at least one additional horizontal member also equally spaced apart from each of the said two horizontal members and fixedly secured at each end to said vertical members of said frame and thereby defining compartments that removably receive said compact music disc cases;
(d) horizontal mounting strips fixedly secured into said frame, and hook and loop pile first fastener means attached to said mounting strips which cooperates with mating hook and loop pile for first fastener means secured to said compact music disc cases for holding the compact music disc cases into said frame;
(e) a back board fixedly secured to said frame;
(f) a second mating hook and loop pile fastener means secured to an edge of said frame for holding duplicate pluralities of said frames together when displayed in a grouping; and
(g) a cut-out opening provided in some edges of one side of said vertical members whereby the tips of a person's finger may be received to remove a case of said compact music disc cases from said frame.

4,940,148
RETAIL DISPLAY WIRE CUBE
Joel H. Alperson, 3306 S. 157th St., Omaha, Nebr. 68130
Filed Apr. 10, 1989, Ser. No. 335,888
Int. Cl.[5] A47F 5/14
U.S. Cl. 211—181 **5 Claims**



1. A retail display wire cube adapted for secure removable attachment to a similar cube stacked immediately therebelow, said retail display cube comprising:
(A) a pair of upright grids located in directionally transversely spaced and substantially parallel relationship, each of said grids horizontally and directionally longitudinally therealong having a top-end overlying a substantially parallel bottom-end;
(B) a plurality of substantially rectangular spacing members which are formed of metallic wire and are respectively affixed to said spaced grids, each of said spacing members being directionally longitudinally co-axially aligned with each other at incremental spacings, said spacing members including two terminal members and a plurality of intermediate members, and both of said terminal members including two spaced-apart vertical upper-lengths located above the grids' top-ends and also including two spaced-apart vertical lower-lengths extending below the grids' bottom-ends; and
(C) U-shaped attachment means permitting secure removable attachment of said retail display wire cube to a similar cube stacked immediately therebelow, said attachment means being carried by all lower-lengths of said terminal spacing members, and each said attachment means lying along and below the upright plane of the cube grid portion and having a lower-terminus located deeply below its host transverse spacing member, the vertical legs of the U-shaped attachment means abuttably flanking the vertical upper-lengths of both terminal members of said similar cube stacked immediately therebelow.

4,940,149
BUILDING ASSEMBLY SYSTEM
Donna L. Vineis, 1042 Welsh Rd., Lansdale, Pa. 19446
Filed Jul. 15, 1988, Ser. No. 219,259
Int. Cl.[5] A47F 5/00
U.S. Cl. 211—186 **36 Claims**



1. A kit for assembling a plurality of pieces into an article of manufacture comprising:
(a) a plurality of rectangular block members wherein each provides a first opening formed at either end as well as a plurality of openings through two of its rectangular faces, and wherein opposite and through each first opening a second opening is orthogonally formed;
(b) a first square block member having a male extension formed upon two adjacent faces for respectively mating with said first openings formed on the ends of two said rectangular members, and each said extension including a second orthogonally formed opening, said first square block member providing a means for joining together two rectangular members at right angles with respect to one another;
(c) a second square block member having a single male extension formed upon one of its faces for mating with one said first openings at the end of a rectangular block member wherein said single extension includes a second orthogonally formed opening and said second block member providing a means for joining with one said end location of a single rectangular block member; and

(d) first, second and third connecting means wherein said first connecting means is adapted to mate with any two first openings for joining respective rectangular block members to one another in a linear or alternatively, angular formation, said second connecting means being adapted to mate with any two openings formed through two of the rectangular faces for coupling said block members to one another, and said third connecting means adapted to mate with any said orthogonal openings for locking said joined and/or coupled rectangular members to one another;

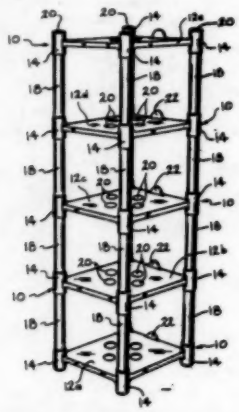
(e) a flat rectangular member having equal cut-outs located on opposite ends of one of its largest dimensional sides and adapted to form a shelf between four linear formations of said rectangular block member.

4,940,150

MODULAR STORAGE RACK

William E. Spengler, Perrysburg, Ohio, assignor to Tolco Corporation, Toledo, Ohio

Filed Jul. 14, 1989, Ser. No. 380,012
Int. Cl.[5] A47B 47/00
U.S. Cl. 211—188 **4 Claims**



1. A rack for storing items comprising in combination: a shelf member having pairs of opposed leg receptors positioned in spaced relationship about the perimeter of said shelf member, said shelf member having an upraised stop lip located proximate one edge for facilitation of positioning of such stored items on said shelf member; and leg members for mating with said receptors to extend in opposed directions from said shelf member, thereby providing for stacking of said shelf members to form a vertical rack with said leg members interspersed between said shelf members and wherein said shelf members include a plurality of knockout plugs in the surface of said shelf members, wherein said knockout plugs are removed from said shelf members and mated with any unused leg receptors thereby sealing any of said unused leg receptors.

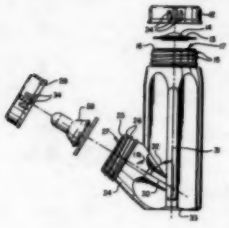
4,940,151

INFANT FLUID DRINKING CONTAINER

Michael E. Fett, P.O. Box 990, Little Elm, Tex. 75068

Filed Jul. 24, 1989, Ser. No. 383,524
Int. Cl.[5] A61J 9/00
U.S. Cl. 215—11.1 **7 Claims**

1. An infant fluid drinking/nursing container including a reservoir with a principal elongated section having a first principal axis and a lesser elongated section having a second principal axis, said second principal axis being disposed at an angle less than 90 degrees with respect to said first principal axis, a first opening in said principal elongated section at the outer extremity thereof, a second opening in said lesser elongated section at the outer extremity thereof, means at each of said openings adapted for attaching a feeding element thereto,



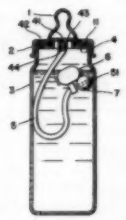
and means including a pair of handles attached to said principal elongated section for holding said container while fluid is being consumed therefrom.

4,940,152

NURSING BOTTLE

Tzong-Shyan Lin, No. 1, Lane 144, Min Sheng Road, Sec. 2, Tainan, Taiwan

Filed Jun. 27, 1989, Ser. No. 371,818
Int. Cl.[5] A61J 9/00, 9/04
U.S. Cl. 215—11.5 **4 Claims**



1. A nursing bottle, comprising:

a fixing disk mounted on the nursing bottle and including a first pipe connector projecting downwardly from the center of said fixing disk, said fixing disk functioning to cap said nursing bottle;

a nipple mounted on said fixing disk;

suction means for defining a suction opening and including a length of flexible suction pipe connected at one end to said first pipe connector, and

a weight element connected to the other end of said flexible suction pipe; and

a float attached to said suction means adjacent said weight element, said float having a buoyancy force greater than the weight of said weight element to keep said suction opening submerged near the surface of a liquid in said nursing bottle.

4,940,153

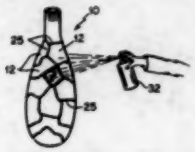
DECORATIVE BOTTLE AND METHOD OF FABRICATING

Noel I. Pilgrim, Jr., 171-14 119th Ave., St. Albans, N.Y. 11434

Filed Oct. 14, 1988, Ser. No. 258,009
Int. Cl.[5] B44C 1/10, 1/14
U.S. Cl. 215—12.2 **2 Claims**

1. A decorative bottle comprising design pieces of printed matter having irregular and complementary outlines getting cut out in puzzle manner from a printed sheet such as one of a

newspaper, map and magazine picture, and adhered to said bottle's outer surface so as to fit adjacent to each other to form a composite and continuous decorative layout, at least one space between the design pieces filled with at least one metal foil piece cut to conform with the irregular outlines of the



design pieces defining the space, a border line marked on borders of adjacent design pieces and on borders of design pieces and adjacent said at least one metal foil, and a spray application of sealant material covering the surface of the design pieces, said at least one foil piece and said border line.

4,940,154

LIQUID STORAGE CONTAINER WITH CLOSURE CAP

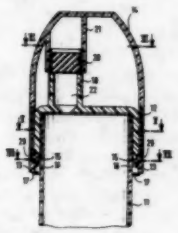
Herbert Vollmar, Much, Fed. Rep. of Germany, assignor to Walter Sarstedt Geraete und Verbrauchsmaterial fuer Medizin & Wissenschaft, Nuembrecht-Rommelsdorf, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 363,669

Claims priority, application Fed. Rep. of Germany, May 27, 1988, 3818115

Int. Cl.[3] B65D *41/46*

U.S. Cl. 215—249 **12 Claims**



1. A liquid storage container for transporting liquids from a filling location to an investigation location, the container comprising:

a tubule having an open front end and an outer wall having a latching means adjacent to the front end;

a removable closure for the front end for filling and emptying the tubule;

a closure cap mountable on the front end of the tubule for covering the closure, the closure cap having an opening adapted to receive the closure therein and including a locking ring attached to the closure cap defining a tearable connection, the locking ring engaging the latching means on the tubule when the closure cap is mounted on the front end of the tubule for preventing the removal of the closure cap unless the tearable connection is first destroyed.

4,940,155

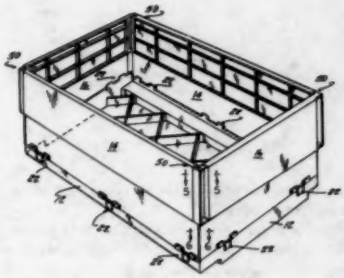
COLLAPSIBLE CONTAINER

Kenneth E. Hewson, 4884 Hardwoods Dr., West Bloomfield, Mich. 48033

Filed Mar. 14, 1988, Ser. No. 167,880

Int. Cl.[3] B65D *6/18*

U.S. Cl. 220—6 **19 Claims**



15. A collapsible container comprising:

a rectangular bottom wall;

two opposed vertical side walls;

two opposed vertical end walls;

hinge means for pivotally and releasably attaching said side and end walls to said bottom wall, said side and end walls pivotable between an erected position generally perpendicular to said bottom wall and a collapsed position generally parallel to and overlying said bottom wall, said hinge means including each side and end wall having a first hinge portion with an integrally formed double pivot pin adjacent a bottom edge, said double pivot pin having outwardly extending, cylindrical projections generally parallel to said bottom edge integrally formed with a tab connecting said double pivot pin to each respective side and end walls, and each side and end wall having a corresponding cooperating second hinge portion, adjacent said first hinge portion, with an integrally formed pair of semi-cylindrical surfaces peripherally spaced from each other along an edge of said rectangular bottom wall, said semi-cylindrical surfaces each defining an aperture of sufficient size to allow said cylindrical projection of said double pivot pin to pass radially through said aperture into engagement with said semi-cylindrical surface; and

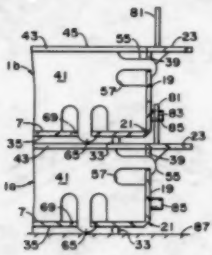
corner joint means for locking said side and end walls in said erected position, said corner joint locking means including said side wall having a groove formed on an exterior surface adjacent a vertically extending edge and said end wall having a flange extending generally parallel with said side wall, a second flange extending inwardly from said first flange and engageable within said groove, and a third flange having a surface generally parallel to said second flange engaging a corner edge of said side wall with a ridge formed on said surface to releasably lock said side and end walls in said erected position.

4,940,156

THERMOPLASTIC MULTI-PURPOSE TRAY WITH VARIABLE COMPARTMENTS

James H. Cote; Jurgen Ekberg, both of Export; Bruce T. Cleevely, and Harry M. George, both of Pittsburgh, all of Pa., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Jul. 13, 1989, Ser. No. 383,102
Int. Cl.[5] B65D 73/02, 25/06, 6/18
U.S. Cl. 220—22.3 14 Claims



1. A thermoplastic tray for the storage and transportation of leadframes, comprising:

a receptacle comprising a rectangular base having opposed first and second sides; a first side wall on said rectangular base, terminating in a flanged portion extending perpendicularly thereto, integrally molded to a first side of said base across a first hinge line; and a second side wall on said rectangular base, terminating in a flanged portion extending perpendicularly thereto, integrally molded to an opposed second side of said base across a second hinge line; and

a plurality of elongated dividers, each divider having a first engaging member at one end engageable with said first side wall and a second engaging member at the other end engageable with said second side wall; such that when at least one elongated divider extends across said base, with the first engaging member engaged with said first side wall to hold the same in upright position, said second side wall is pivotal to an upright position and engages the second engaging member to hold the second side wall in upright position.

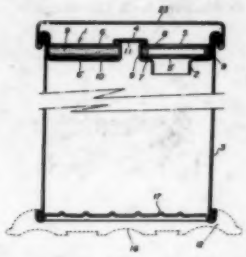
4,940,157

METHOD OF TREATING MEDICAL WASTES AND CONTAINERS TO BE USED FOR THE TREATMENT METHOD

Jitsuo Inagaki, 71, Aza Kamiyashiki, Oaza Itsusiki, Itsusikicho Hazugun Aichi, Japan

Filed Apr. 12, 1989, Ser. No. 337,078
Claims priority, application Japan, Feb. 27, 1989, 1-43120
Int. Cl.[5] B65D 51/18
U.S. Cl. 220—254 18 Claims

1. An article for treatment of medical wastes comprising a container having an opening, a lid section including a certain amount of elastic filler material between an inner lid and a top lid and rigidly fitted into the opening of the container, a pair of input ports provided on said lid section for disposing medical wastes therethrough and a pair of rotary lids for opening and closing said input ports, wherein said input ports are provided with a larger opening and a smaller opening which is in communication with the larger opening and so dimensioned to come into engagement with a needle of a syringe so that the



needle can be removed from the syringe by pulling up the syringe from the opening.

4,940,158

CONTAINER AND SEAM RING FOR CONTAINER

Christopher J. Farrell, Arlington Heights; Thomas Hlobil, Fox River Grove, and George F. Nahill, Crystal Lake, all of Ill., assignors to American National Can Company, Chicago, Ill.

Filed Sep. 22, 1987, Ser. No. 100,293
Int. Cl.[5] B65D 51/00
U.S. Cl. 220—258 23 Claims

1. A container comprising:

(a) a container body having a side wall and an outer and inner surface and a top peripheral edge portion defining the top opening of the container body;

(b) a closure secured to the container body at a seam along the peripheral edge portion to close the top opening thereof, the seam extending outwardly from the adjacent surface of the container body, the closure having a parting line interior of the top peripheral edge portion at which the area within the parting line can be removed from the remainder of the closure; and

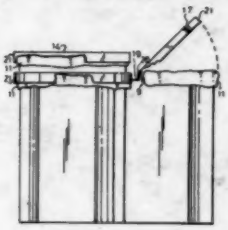
(c) a plastic seam ring mounted over the seam which conceals the same, the seam ring having a top portion and inner and outer skirts descending downwardly from the top portion, and means for securing the seam ring to the container body, the inner skirt of the seam ring having an inner bottom edge which is spaced closely adjacent to the parting line in the closure such that the area of the closure bounded by the parting line can be readily removed from the container, said seam ring alone or in cooperation with the container body concealing all or substantially all of the closure which remains on the container body after removal of the area of the closure within the parting line, the means for securing the seam ring to the container body including an inwardly facing bead formed on the inner surface of the outer skirt which extends under the seam and holds the seam ring in position on the container body,

and wherein the outer surface of the outer skirt has a descending inwardly angled surface which extends to the container body side wall to make it difficult to remove the seam ring from the container body.

4,940,159
COMPARTMENTED REFUSE CONTAINER

Anise M. Callas, 1915 N. 31st Rd., Hollywood, Fla. 33021, and Steven S. Casper, 561 Bayshore Dr., Fort Lauderdale, Fla. 33304

Continuation-in-part of Ser. No. 361,432, Jun. 5, 1989, abandoned. This application Jul. 20, 1989, Ser. No. 382,398
Int. Cl.[5] B65D *25/16*
U.S. Cl. 220—404 **7 Claims**



1. A compartmented waste receptacle for segregating different types of solid wastes in separate covered and lined chambers, said receptacle comprising:

(a) a central chamber having vertical sides and an open top with an upstanding rim;

(b) a first adjoining chamber sharing one common vertical side with said central chamber and having an open top with an upstanding rim;

(c) a second adjoining chamber sharing one common vertical side with said central chamber and having an open top with an upstanding rim;

(d) a pair of opposed vertical bag-engaging notches extending downward from said upstanding rim of each of said chambers, said pair of notches arranged in combination with said rim to hold a bag liner folded over a portion of said rim and extending suspended between said notches;

(e) a separate cover arranged to cover each said chamber, each said cover having a downward directed edge flange extending over said rim and said bag liner, said cover having a top-opening movable portion hingedly connected to a fixed portion by hinge means, said hinge means arranged along a vertical side adjacent said pair of notches.

4,940,160
NEWSPAPER VENDING MACHINE AND PROMOTIONAL DISPLAY APPARATUS THEREFOR

Ronald E. Williams, Moscow, Id., assignor to Tribune Publishing Company, Lewiston, Id.

Filed Dec. 27, 1988, Ser. No. 290,502
Int. Cl.[5] G07F *11/04*
U.S. Cl. 221—34 **20 Claims**

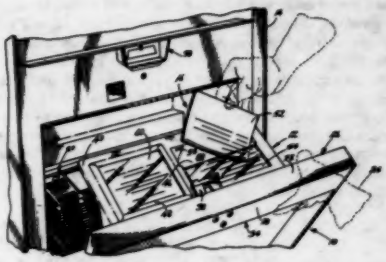
16. A newspaper vending machine comprising:

a housing having an internal cavity which retains newspapers in a stack;

a spring loaded and locked door which is pivotally mounted to the housing and swings away from the housing when unlocked and pulled upon by a user to enable access to newspapers within the housing cavity, the door having an inside door portion which faces internally into the housing cavity, the door having an outside door portion which faces externally away from the housing, the outside door portion having a handle for a user to grasp, the door being spring biased to a normally closed and locked state;

a money receiving and locking mechanism to receive a users money and unlock the door so it can be swung away from the housing to make a newspaper within the housing cavity accessible to the user;

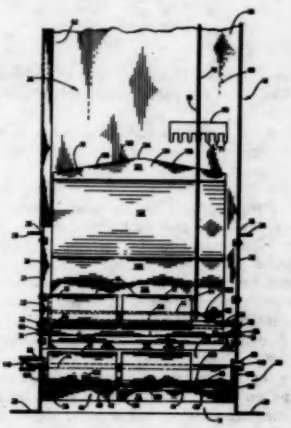
a promotional display apparatus extending from the newspaper vending machine door, the promotional display apparatus including a display section for displaying promotional information, the display section projecting internally away from the inside door portion, the display section projecting into the housing cavity elevationally above and over a stack of newspapers therein when the newspaper vending machine door is closed, the display section in operation effectively displaying the promotional information to the user when the newspaper vending machine door is swung away from the housing.



4,940,161
RAMP APPARATUS

Larry E. Hieb, Fresno, Calif., assignor to The Vendo Company, Fresno, Calif.

Filed Jun. 28, 1988, Ser. No. 212,580
Int. Cl.[5] B65G *59/00*
U.S. Cl. 221—67 **11 Claims**



1. In a vending machine for dispensing containers, the containers having a substantially common diametral dimension and outer surfaces individually substantially concentric to their respective longitudinal axes, and the vending machine having at least one staggered stack column of said containers defined by first and second walls borne by the vending machine and

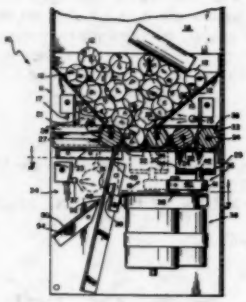
disposed in spaced relation to each other and operable gravitationally to channel the staggered stack column of containers toward a dispensing position and a dispensing mechanism operable successively to dispense the containers during vending, a ramp apparatus comprising a ramp mounted on the first wall in close proximity to said dispensing mechanism and having a sloped surface convergent in a downward direction toward the second wall to define a dispensing opening which has a dimension greater than said diametral dimension, and said ramp having an upper edge so configured that contact between said upper edge and the outer surface of each container passing thereover is substantially only along a line of contact on said outer surface of the container substantially parallel to said longitudinal axis of the container and is sufficiently less than the length of the container to promote shifting of the containers so as to inhibit bridging of said containers whereby said staggered stack column is caused to converge to form a single stack column in close proximity to the dispensing mechanism so that a maximum number of containers can be housed in said staggered stack column and a single column dispensing mechanism can be employed.

4,940,162

ROLLED COIN DISPENSER

Matthew G. Thie, Indianapolis, Ind., assignor to Autovend, Inc., Indianapolis, Ind.

Filed Oct. 17, 1988, Ser. No. 258,662
Int. Cl.[5] G07F 11/44
U.S. Cl. 221—129 **8 Claims**



7. An apparatus for dispensing rolls of different denominations of rolled coins and paper money stored in tubes comprising

a reservoir for holding each denomination to be dispensed, each reservoir having a bottom with an opening extending therethrough;

means for dispensing each denomination, the dispensing means for a particular denomination disposed beneath the respective reservoir for each denomination, the dispensing means including at least a pair of spaced apart rollers forming a pocket therebetween for receiving a roll and means for mounting the rollers for reciprocal movement underneath the respective reservoir between a loading position wherein the pocket is beneath the opening in the bottom of the reservoir and an eject position, the roller mounting means comprising a roller mounting bracket to which the rollers are rotatably mounted, and further including an eject chute mounted at the eject position, a slide member mounted beneath the rollers and extending from beneath the opening in the bottom of the reservoir to an inlet of the eject chute, the coin roll riding on the slide member when moved by the rollers and being pushed into the eject chute from the slide member by the rollers to dispense the roll from the apparatus;

each dispensing apparatus having means for reciprocating its roller mounting means between the loading position and the eject position to permit a roll to move into the pocket when the rollers are in the loading position and to dispense the roll from the apparatus when the rollers are in the eject position and also to agitate the rolls in the reservoir by at least one of the rollers as the rollers are reciprocated between the loading position and the eject position, and

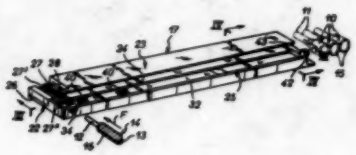
means for selecting which dispensing means to actuate to dispense a roll of a selected denomination.

4,940,163

WIRING ACCESSORY DISPENSER

Alain Baillet, Montville; Francois Loisel, Marumme, and Daniel Paulin, Bosc le Hard, all of France, assignors to Legrand, Limoges, France

Filed Feb. 3, 1989, Ser. No. 305,639
Claims priority, application France, Feb. 5, 1988, 88 01356
Int. Cl.[5] B65H 1/00
U.S. Cl. 221—193 **17 Claims**



1. A dispenser for wiring accessories, the dispenser being of generally flat elongate configuration and comprising a baseplate, a bar overlying the baseplate and extending transversely across said baseplate a distance less than the entire width of said baseplate, said bar having a longitudinal groove parallel to said baseplate and running the full length of said baseplate, said longitudinal groove opening along a longitudinal edge of said bar, an upstanding lip on said baseplate disposed in parallel spaced relation with said one longitudinal edge of said bar, a longitudinal extension at one end of said baseplate, said extension having a transverse cradle for accommodating a wiring accessory, a longitudinal finger projecting cantilever-fashion from said bar and over said cradle for retaining a wiring accessory in said cradle.

4,940,164

DRINK DISPENSER AND METHOD OF PREPARATION

Mark W. Hancock, and Marvin M. May, both of Los Angeles, Calif., assignors to Aquatec, North Hollywood, Calif.

Filed Jun. 26, 1987, Ser. No. 68,017
Int. Cl.[5] B67D 5/08
U.S. Cl. 222—66 **16 Claims**

1. Carbonator apparatus for operation on a bottled supply of water, the apparatus comprising:

a liquid reservoir having a top opening for receiving a bottled supply of water therein for automatically refilling said reservoir from the bottled supply of water;

means for cooling water in said reservoir to form a quantity of ice therein including means disposed to sense the thickness of said ice to maintain the quantity of ice within selected limits;

carbonator means disposed in thermal relationship to the water in said reservoir to be cooled thereby;

pumping means for pumping water from said reservoir into said carbonator means;

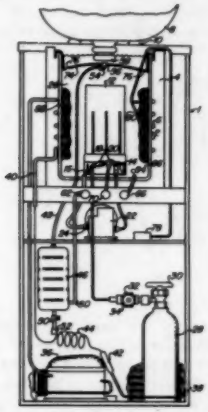
dispensing means for selectively withdrawing carbonated water from the carbonator means;

first means for sensing when the liquid level therein drops below a predetermined level;

second means for sensing when water in the reservoir is depleted below a selected level; and

control means responsive to first and second means to enable

said pumping means when said liquid level in said carbonator means drops below said predetermined level, and to



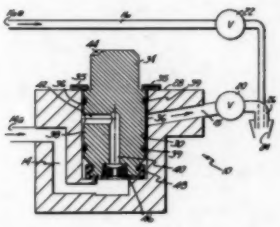
prevent said pumping means from pumping in response to water in the reservoir being depleted below said selected level.

4,940,165

METHOD OF AND DISPENSING HEAD FOR INCREASED CARBONATION

John R. McMillin, San Clemente, Calif., assignor to The Cornelius Company, Anoka, Minn.

Filed Apr. 8, 1988, Ser. No. 179,331
Int. Cl.[5] B67D *5/56*; F16K *19/00*
U.S. Cl. 222—129.1 **18 Claims**



1. In a carbonated water dispensing head having a carbonated water inlet port leading to a flow control housing having a cylindrical inner surface, a carbonated water flow control body fixed in and sealed to said housing, a self compensating water flow rate control device in said body, a water feed port from the cylindrical inner surface to a normally closed water valve, and an outlet port from the water valve to a dispensing nozzle;

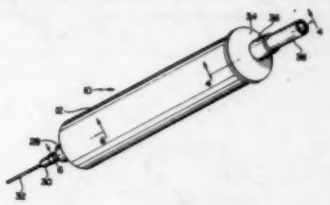
the improvement for providing increased carbonation in dispensed carbonated water, comprising a flow control body outer diametric surface (fitted) positionally fixed within and sealed to the housing cylindrical inner surface, a carbonated water flow port through the inside of said flow control body and said flow rate control device and into fluid communication with said inner surface, said housing cylindrical inner surface and said outer flow control body diametric surface jointly defining in a toroidal space between them a carbonated water decompression chamber downstream of said flow rate control device, said decompression chamber being fluidly between the inlet port and the feed port and downstream of the flow control body, said decompression chamber having a carbonated water passageway area which is less than the area of the feed port.

4,940,166

METHOD AND APPARATUS FOR APPLYING DECORATIVE COATING MATERIALS TO A SURFACE

Webster M. Pidgeon, 138 Webster Ave., Providence, R.I. 02909

Filed Oct. 14, 1988, Ser. No. 258,198
Int. Cl.[5] B67D *5/52*
U.S. Cl. 222—136 **1 Claim**



1. A dispenser for simultaneously applying a plurality of discrete decorative coating materials to a jewelry finding, comprising an elongated cylindrical housing having an upper end and a lower end, an elongated separator member formed of a rigid material, said separator member being located in said housing, said separator member having a central axis and including an axial portion which extends along said axis and a plurality of walls which radiate outwardly from said axial portion and cooperate with said housing to define a plurality of separate compartments, a different colored coating material being located in each of said compartments, a cap mounted on the upper end of said housing, a bottom portion located in said separator member at the lower end thereof and having a relatively small recess formed therein, feed passages of relatively small diameter formed in said bottom portion closely adjacent said axis that provide communication between said recess and said compartments, an elongated small diameter dispensing nozzle mounted on the lower end of said housing and communicating with said recess for receiving the coating materials in unmixed relation therein, said dispensing nozzle having an inlet end and being substantially aligned with said axis, said feed passages being directed substantially toward said inlet end to promote substantially direct flow of said materials from said feed passages to said inlet end and to thereby minimize intermixing of said materials as they pass from said feed passages to said inlet end, and means cooperating with said cap for introducing a fluid medium under pressure into the top of said housing wherein said fluid medium exerts a downward force on said coating materials as located in said compartments to simultaneously force said discrete coating materials into said recess, said coating materials thereafter being directed under pressure into and through said nozzle for application in unmixed discrete colorations onto a surface of a jewelry finding for imparting a decorative multicolor design thereon.

4,940,167

CHILD RESISTANT DISPENSING CLOSURE

William E. Fillmore, Toledo, and Timothy J. Fuchs, Perrysburg, both of Ohio, assignors to Owens-Illinois Closure Inc., Toledo, Ohio

Filed Jan. 27, 1989, Ser. No. 302,850
Int. Cl.[5] B67B *5/00*
U.S. Cl. 222—153 **2 Claims**

1. A child resistant dispensing closure comprising

a first plastic part having a base wall and a peripheral skirt threaded onto a container,

said skirt of said first part including a radial flange,

said peripheral skirt including interengaging portions that engage portions of a container to resist removal from the container,

said closure including a second plastic part connected to the first part by an integral hinge,

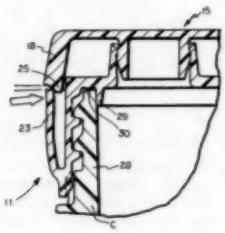
said second part including a base wall and a peripheral skirt,

said base wall of said skirt having a dispensing opening,

said skirt of said second part having diameter smaller than the diameter of the flange so that the flange projects radially beyond the skirt of said second part and the skirt of said second part cannot be raised readily when the second part is in closed position with the skirt of said second part engaging said flange on the first part,

said skirt of said first part including a radial flange that extends circumferentially about most of the periphery of said skirt,

said first part having a deflectable wall panel spaced radially outwardly of said skirt and extending upwardly and axially outwardly and integrally joined to said skirt of said first part adjacent said free edge and along circumferentially spaced axis of said skirt,



said radially deflectable wall panel having an upper free edge at least a portion of which underlies the free edge of said skirt of said second part when the second part is in closed position,

said flange extending along said radially deflectable wall,

said skirt of the second part having an axial rib extending between the deflectable wall panel on the first part and the skirt of the first part such that when the deflectable panel is pressed radially inwardly, the panel engages the rib camming the skirt of the second part upwardly and exposing it so that it may be opened,

said base wall of said first part including a shoulder projecting axially for engaging and centering the second part and supporting the skirt of said second part against radial deflection.

4,940,168

CONNECTOR

David W. Shadwell, Macclesfield, and Martin Joseph, Altrincham, both of England, assignors to Imperial Chemical Industries PLC, London, England

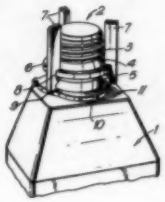
Continuation of Ser. No. 64,567, Jun. 22, 1987, abandoned. This application Mar. 28, 1989, Ser. No. 332,397

Claims priority, application United Kingdom, Jun. 24, 1986, 8615410

Int. Cl.[5] B67B *5/00*

U.S. Cl. 222—153 **12 Claims**

1. A first fluid-handling device having a fluid outlet portion; a second fluid-handling device having a fluid inlet portion, wherein said first fluid-handling device is a container and the second fluid-handling device is a dispenser; means for coupling said fluid outlet portion to said fluid inlet portion including support means extending from one of said fluid handling devices towards the other; a member directly mounted to said fluid outlet portion and movable axially relative thereto between a first position and a second position so that in the first position said movable member and said support means are engaged and said fluid outlet portion is coupled to said fluid inlet portion and in the second position the movable member and the support means can be disengaged so that the said fluid outlet portion and said fluid inlet portion can be disconnected; and means for preventing axial movement of said movable member from said second position to said first position;



the support means comprising arms depending from the dispenser having formations adapted to engage with the member in the first position, and adapted to permit disengagement of the container therefrom when the number is in the second position.

4,940,169

AERATED LIQUID STORAGE/DISPENSING APPARATUS

Martin F. Ball, Wantage, England, assignor to Metal Box Public Limited Company, Reading, United Kingdom

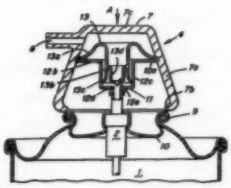
Continuation of Ser. No. 908,992, Sep. 18, 1986, Pat. No. 4,785,977. This application May 26, 1988, Ser. No. 199,290

Claims priority, application United Kingdom, Sep. 24, 1985, 8523575

The portion of the term of this patent subsequent to Nov. 22, 2006, has been disclaimed.

Int. Cl.[5] B65D *83/00*

U.S. Cl. 222—399 **19 Claims**



1. Apparatus for storing and dispensing a quantity of aerated liquid for maintaining carbonation of a beverage in a container in which the extent of aeration is maintained as said quantity is progressively dispensed, said apparatus comprising a vessel containing a source of gas; a valve closing said vessel; a pressure regulator coupling said valve to said container, said regulator being capable of delivering said gas to said container at a substantially constant pressure substantially lower than said pressure under which said gas is kept in said vessel; said regulator comprising a housing, a diaphragm, and means supporting a diaphragm in the housing, said diaphragm having a ratio of the area downstream thereof to the area upstream thereof so that the gas is caused to be delivered to said container at said constant pressure lower than said pressure under which said gas is kept in said vessel and flow control means which permit delivery of said gas to, and dispensing of said liquid from, said container, said vessel being an aerosol can having a closure cup and containing carbon dioxide, and said regulator having a skirt portion arranged for engagement with said closure cup, the arrangement being such that in a transit condition of the apparatus, said valve is closed and in an operational condition

of the apparatus, said skirt portion is engaged with said cup and said pressure regulator engages said valve, thereby causing said valve to be open, wherein said skirt portion has an inturned rim that snap-fits with the aerosol can closure cup.

4,940,170

SPRAY HEAD FOR USE WITH A CAN CONTAINING A LIQUID EXPOSED TO THE PRESSURE OF A PROPELLANT

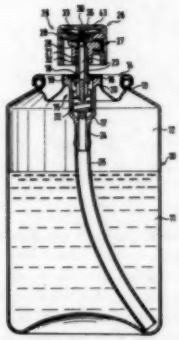
Hildegard Popp-Ginsbach, Munich, Fed. Rep. of Germany, assignor to F.P.D. Future Patent Development Co., S.A., Luxembourg

Filed Nov. 3, 1988, Ser. No. 266,815

Claims priority, application Fed. Rep. of Germany, Nov. 10, 1987, 3738163; Dec. 17, 1987, 3742901

Int. Cl.[5] B05B *3/16*

U.S. Cl. 222—402.1 13 Claims



1. A spray head for a can (10) containing a liquid medium (11) exposed to the pressure of a propellant (12), and said spray head being disposed at the free end of a dispensing tube (21) of a dispensing valve connected to the can, said dispensing tube having a discharge duct, aid spray head comprising a spray nozzle (27) having a passageway in fluid-communication with the discharge duct (23) of the dispensing tube (21), a throttle member (29) in said fluid-communication passageway (28) and including a resiliently biased throttle body (30) connected to said spray nozzle and formed as a single piece element including a resilient element which is exposed to ambient pressure on one side and to the overpressure prevailing in the can interior on the other side thereof during the discharge of the liquid medium, and throttle body including a member integrally connected to said resilient element and positioned in said passageway for controlling the flow cross-section (31) of said passageway in dependence on the overpressure in the can to establish an approximately constant liquid quantity per unit of time of discharge through the spray nozzle (27) until the can (10) has been substantially emptied, said resilient element constructed and arranged to establish resilient bias of the throttle body (30) effective substantially only upon use when the dispensing valve (15) is opened to establish a varying discharge opening, such that with the overpressure in the can at a maximum, a minimum flow cross-section (31) is established and with a minimum residual overpressure in the can (10) the flow-cross-section (31) is maximum.

4,940,171

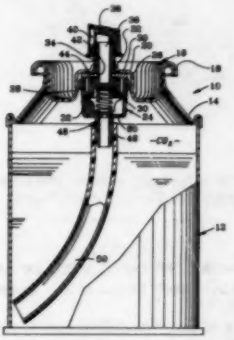
AEROSOL PACKAGE HAVING COMPRESSED GAS PROPELLANT AND VAPOR TAP OF MINUTE SIZE

Gordon C. Gilroy, R.F.D. 2, Darby La., Bedford, N.H. 03102

Filed May 18, 1989, Ser. No. 354,125

Int. Cl.[5] B65D *83/58*

U.S. Cl. 222—402.18 7 Claims



1. In an aerosol package comprising a container and a dispenser valve mounted on the container, the valve comprising a cylindrical body mounted upright at the center of the top of the container and having a bottom wall and a gasket at its upper end and a plunger in the body having a hollow stem passing up through the gasket and through the top of container and terminating in an actuator operable from the top of the container, a dip tube connected to and extending from the cylindrical body down in the container, the container being partly filled with liquid product and having thereabove an atmosphere of compressed gas selected from a group including carbon dioxide and nitrous oxide to propel the liquid up the dip tube and through the valve and out the actuator when the valve is open; the improvement of at least one vapor tap opening in the cylindrical body above the level of the liquid product whereby said compressed gas is free to flow through the vapor tap opening and through the dispenser valve when the valve is open, each vapor tap opening having a diameter in the range of only about 0.004 inch to only about 0.008 inch.

4,940,172

FILLING APPARATUS FOR FILLING A CONTAINER WITH A MEASURED AMOUNT OF A LIQUID, PASTY OR LUMPY PRODUCT

Dieter Müller, Haan, and Georg Fischer, Velbert, both of Fed. Rep. of Germany, assignors to Benz & Hilgers GmbH, Duesseldorf, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,671

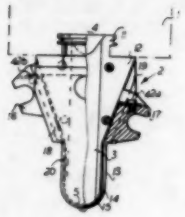
Claims priority, application Fed. Rep. of Germany, Feb. 4, 1988, 3803230

Int. Cl.[5] B67D *3/00, 5/06*

U.S. Cl. 222—505 16 Claims

15. An apparatus for filling a container with a measured amount of a liquid, pasty or lumpy product comprising at least one mouthpiece having a supporting member on a side thereof and a filling duct whose outlet mouth is closable by at least one flexible steel cutoff band guided in a passage in a vicinity of said outlet mouth in an elongated outlet piece of said mouthpiece which is rounded on its bottom portion, said cutoff band being slidable in the vicinity of said outlet mouth of said

mouthpiece in and opposite a transport direction of said container in said apparatus for filling, a carriage guided slidably in



a T-groove of the supporting member and attached at one end to said cutoff band to drive said cutoff band.

4,940,173

BACKPACK AND INSULATED CONTAINER

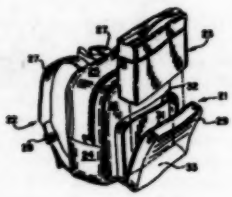
Jeffrey M. Jacober, South Kingston, R.I., assignor to SGI Inc., Cranston, R.I.

Continuation of Ser. No. 59,250, Jun. 5, 1987, Pat. No. 4,767,039, which is a continuation of Ser. No. 830,522, Feb. 17, 1986, abandoned, which is a division of Ser. No. 669,862, Nov. 8, 1984, abandoned. This application Aug. 29, 1988, Ser. No. 239,032

The portion of the term of this patent subsequent to Nov. 17, 2004, has been disclaimed.

Int. Cl.[5] A45C *15/00*

U.S. Cl. 224—151 **11 Claims**



1. A combination backpack and removable insulated container, comprising:

an insulated container component, said insulated container component including a plurality of pliable panels, said pliable panels including a bottom panel and side panels that are joined together at their respective edges into a compartment having a body and an open mouth defined by edges of the side panels, each of said panels having thermal insulation means, said insulated container component further including a pliable cover member for selectively opening and closing said open mouth;

closure means for securing said pliable cover member to said body of the insulated container, said closure means selectively joining or disjoining less than the full periphery of the cover member to the body of the insulated container component, the remainder of said full periphery of the cover member being hingedly attached to said body of the insulated container;

a backpack component, said backpack component including a plurality of pliable fabric panels that are joined together to form a pliable backpack body defining a backpack interior, said backpack body having an interior surface and an exterior surface, closure means for selectively gaining access to said interior of the backpack body; and

a sleeve component secured to at least one of said fabric panels of the backpack component, said sleeve component having a mouth, and said sleeve component and its mouth are sized and structured to closely receive, hold and support said insulated container component and to permit quick and easy removal of the insulated container as a unit from said sleeve, and said sleeve component is sized for and is located on said backpack component for avoiding substantial reduction of the size of said interior of the backpack body.

4,940,174

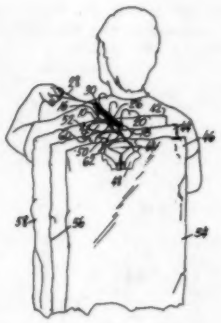
GARMENT SUPPORTING SYSTEM INCLUDING TIE THEREFOR

Robert McD. Parker, 51 E. 78th St., New York, N.Y. 10021-0207

Filed Sep. 14, 1989, Ser. No. 407,353

Int. Cl.[5] A45F *3/14*

U.S. Cl. 224—257 **17 Claims**



1. A garment supporting system comprising in combination at least one garment supporting means provided with a hook-like neck having an aperture located therein and an elongated flexible tie having a less flexible segment located along the length thereof, gripping means disposed on one end and means located near the opposite end for passage of said gripping means and the elongated flexible portion of said tie adjacent thereto therethrough, said tie being disposed through the aperture in said garment supporting means, said gripping means and said elongated flexible portion of said tie being passed through the means for passage therethrough and said garment supporting means being supported on the less flexible segment of said tie, whereby a garment supported on said garment supporting means is transportable with greater ease and control by a user.

4,940,175

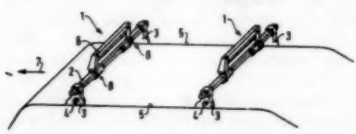
CAR-TOP CARRIER

Eberhard Tittel, Lagerstrasse 1, D-7981 Grunkraut-Gullen, Fed. Rep. of Germany

Filed Mar. 31, 1989, Ser. No. 331,493

Int. Cl.[5] B60R *9/04*

U.S. Cl. 224—324 **8 Claims**



1. A car-top carrier comprising:

supporting elements that can be attached to a vehicle;

at least one supporting member attached to said supporting elements;

at least one holding member disposed on said supporting member for holding objects to be transported; and

a joint disposed between said supporting member and said holding member, a swiveling axis of said joint extending transversely to the direction of travel of said vehicle;

said holding member being rotatable about said swiveling axis between a use position and a nonuse position;

said joint comprising at least one joint member, said joint member being formed in the shape of a disc and comprising at least one circular-arc-shaped curved guide slit around said swiveling axis of said joint; and

said joint comprising another joint member comprising at least one guide slide displacable in said slit.

4,940,176

APPARATUS FOR CUTTING WORKPIECES OF GLASS, CERAMICS, AND LIKE MATERIAL

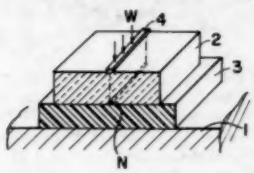
Yasuo Sato, 9-8, Kami-Takaido 2-Chome, Suginami-Ku, Tokyo-To, and Kunio Saeki, 18-7, Higashi-Tamagawagakuen 1-Chome, Machida-Shi, Tokyo-To, both of Japan

Filed Jun. 15, 1988, Ser. No. 207,166

Claims priority, application Japan, Mar. 29, 1988, 63-75077

Int. Cl.[5] C03B *33/03*

U.S. Cl. 225—96.5 **6 Claims**



1. An apparatus for cutting a workpiece of glass, ceramic, or like material on a surface of which an incised line has been formed beforehand along an intended cutting line, said apparatus comprising:

a rigid frame structure;

a backing member supported on said frame structure and functioning to backingly support said workpiece placed thereagainst with said incised line in contact with said backing member, said backing member having a Young's modulus lower than that of the workpiece;

a force applying device supported on the frame structure and operable to apply a localized pressing force on the surface of the workpiece opposite said surface having said incised line at a position directly opposite the point at which said backing member supports said workpiece; and

a feeding mechanism supported on the frame structure and being operable to feed the workpiece, relative to said force applying device, in the direction of the incised line, thereby causing said localized pressing force to be applied along a line parallel to the incised line on said opposite surface of the workpiece, to impart a bending moment to the workpiece in the region thereof around the incised line, and thereby fracturing and cutting the workpiece along a section thereof in which the incised line lies.

4,940,177

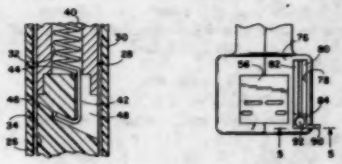
ELECTRIC STAPLER HAVING ELECTRONIC CONTROL CIRCUIT

Carlos L. Jimena, 501 S. Marengo, Pasadena, Calif. 91101

Filed Dec. 30, 1988, Ser. No. 292,101

Int. Cl.[5] B25C *5/15, 7/00*

U.S. Cl. 227—7 **14 Claims**



1. In a machine for fastening a staple into one or more sheets of paper:

a solenoid having an operating coil and an armature, the armature being movable inside a vertically disposed chamber, the armature having an interior air passage therethrough with said passage being open to a lower end of said chamber for cooling purposes;

a staple driver attached to the armature of the solenoid;

an anvil disposed to receive impact of the staple driver when the operating coil of the solenoid is energized to actuate the armature;

spring means interiorly disposed in the armature for biasing the armature away from the anvil to a retracted position when the operating coil is de-energized;

a photosensor near the anvil;

a source of light illuminating the photosensor; and

circuit means responsive to insertion of paper to be stapled between the light source and the photosensor for energizing the operating coil of the solenoid from a source of operating voltage to actuate the armature of the solenoid and drive a staple.

4,940,178

SOLDERING IRON

Fritz Hombrecher, Bad Wertheim, Fed. Rep. of Germany, assignor to ERSA Sachs KG GmbH & Co., Wertheim, Fed. Rep. of Germany

Filed Jul. 20, 1989, Ser. No. 383,191

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1988, 3825048

Int. Cl.[5] B23K *3/02, 3/03*

U.S. Cl. 228—55 **9 Claims**

1. A soldering iron, comprising: a tube member having a front section and a rear section, the diameter of said front section being smaller than the diameter of said rear section; a soldering tip positioned on said front section of said tube, said tip including a rear edge; a spring element positioned about said rear section of said tube and fixed at said rear section by a

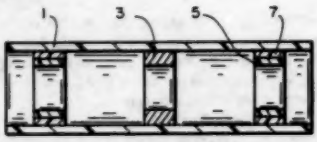
spring element winding portion which closely fits said rear section, said spring element including a front end engaging a hook portion of said soldering tip for fixing said tip axially with respect to said tube; and rotation preventing means connected to said tube and connected to said soldering tip rear edge at said tip rear edge, at a step formed at a top front surface of said tube, adjacent said front section and connected to said soldering tip rear edge said portion preventing means including a tip engaging surface defined at said step and a tube engaging surface defined at said rear edge of said soldering tip for a positive non-rotational locking between said tube and said tip.

4,940,179

DEVICE FOR FORMING A SOLDER CONNECTION

Pravin Soni, Union City, Calif., assignor to Raychem Corporation, Menlo Park, Calif.

Filed Jun. 20, 1989, Ser. No. 368,756
Int. Cl.[5] H01R *4/70*; B23K *3/00*
U.S. Cl. 228—56.3 **14 Claims**



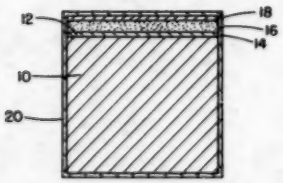
1. A device for forming a solder connection between a plurality of bodies, which comprises:
(a) a hollow, dimensionally heat-shrinkable sleeve;
(b) a solder preform positioned within the sleeve; and
(c) an annular composite adhesive insert positioned coaxially within the sleeve and comprising two layers of heat-activatable adhesive material, the viscosity of the radially inner layer being less than that of the outer layer at the temperature to which the sleeve is heated to cause it to shrink, the arrangement and the relative viscosities of the materials of the two layers being such that the outer layer restricts flow of the material of the inner layer when the sleeve is so heated.

4,940,180

THERMALLY STABLE DIAMOND ABRASIVE COMPACT BODY

Trevor J. Martell, 8 Erica Place, Vale Road, Weltevreden Park, Transvaal, South Africa

Filed Aug. 4, 1989, Ser. No. 389,613
Claims priority, application South Africa, Aug. 4, 1988, 88/5735; Feb. 2, 1989, 89/0823; Feb. 2, 1989, 89/0825
Int. Cl.[5] B23K *31/04*; C04B *35/52*
U.S. Cl. 228—122 **10 Claims**



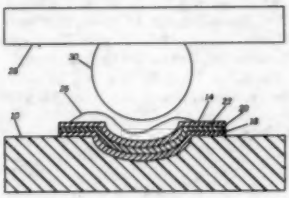
1. A method of producing a thermally stable diamond compact having a metallic layer bonded to a surface thereof, the thermally stable diamond compact comprising a mass of diamond particles containing diamond-to-diamond bonding and a second phase uniformly distributed through the diamond mass, and the metal of the metallic layer being selected from the group of molybdenum, tantalum, titanium and like high melting refractory metal, nickel and an alloy containing a dominant amount of any one of these metals, includes the steps of:
(i) preparing an assembly of a metallic layer, a mass of diamond particles on the metallic layer and a layer of the component or components necessary to form the second phase on the diamond particles, this component or these components having a melting point lower than that of the metallic layer; and
(ii) subjecting the assembly to conditions of elevated temperature and pressure for a period sufficient to produce the diamond abrasive compact, the temperature being controlled such that there is minimal infiltration of the metallic layer into the diamond mass.

4,940,181

PAD GRID ARRAY FOR RECEIVING A SOLDER BUMPED CHIP CARRIER

Frank J. Juskey, Jr., Coral Springs; Barry M. Miles, Plantation, and Anthony B. Suppelsa, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Apr. 6, 1989, Ser. No. 333,670
Int. Cl.[5] B23K *1/20*; H05K *3/34*
U.S. Cl. 228—180.2 **19 Claims**



1. A method for attaching a solder bumped member to a substrate, comprising the steps of:
(A) forming cavities in the substrate, said cavities being approximately two-third the size of the solder bumps:
(B) applying metal to said cavities:
(C) providing an effective amount of solder flux on said metallized cavities:
(D) positioning the solder bumped member so as to align the solder bumps within said metallized cavities;
(E) heating said solder flux so as to electrically couple said metallized cavities to a respective solder bump.

4,940,182

ROTARY SWIVEL FOR CAB HEATING SYSTEM

Dennis J. Heyne, Wausau, Wis., assignor to J. I. Case Company, Racine, Wis.

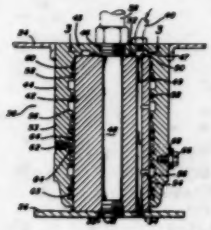
Filed Oct. 27, 1989, Ser. No. 427,384
Int. Cl.[5] B60H *1/02*
U.S. Cl. 237—12.3 B **8 Claims**

1. A vehicle cab heating system comprising:
a vehicle cab having a floor;
a frame, said vehicle cab being mounted on said frame such that said vehicle cab is free to rotate 360 degrees with respect to said frame;
a source of heated fluid mounted within said frame;
a cab heating unit mounted in said cab, said cab heating unit utilizing fluid from said source of heated fluid to supply heat to said cab, said cab heating unit having a fluid inlet receiving heated fluid from said source, said cab heating unit removing heat from said heated fluid and having a fluid outlet for returning a cooled fluid to said source of heated fluid, a fluid supply line connecting said fluid inlet

and said source of heated fluid, a fluid return line connecting said fluid outlet and said source of heated fluid;

said fluid supply line and said fluid return line passing from said cab through a rotary fluid swivel in said floor of said vehicle cab and into said frame to connect to said source of heated fluid; and

said rotary fluid swivel comprising a generally solid upstanding cylindrical boss of a first radius fixed to said frame, a generally hollow cylindrical spindle fixed to



rotate with said vehicle cab floor and having an inner periphery received about said boss, said fluid supply line including a supply conduit extending through said boss at a central portion thereof, said supply conduit having a second radius, said first radius being much larger than said second radius, thus defining a solid portion between said first and said second radii, said fluid return line including a return conduit extending through said solid portion at a third radius between said first and second radii.

4,940,183

ARRANGEMENT FOR FASTENING RAILS

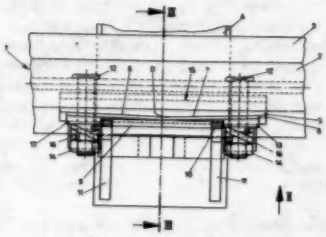
Johann Rieger, and Hermann Orasche, both of Zeltweg, Austria, assignors to Voest-Alpine Maschinenbau Gesellschaft m.b.H., Linz, Austria

Filed May 3, 1989, Ser. No. 346,746

Claims priority, application Austria, May 10, 1988, 1231/88

Int. Cl.[5] E01B *9/60*

U.S. Cl. 238—310 **7 Claims**



1. An arrangement for fastening a rail of the type having a running surface and a rail foot interconnected by a web and wherein the running surface has a running edge at one side thereof, the fastening arrangement comprising a strap pressed against said web at a location adjacent the edge of the running surface opposite the running edge, said strap being urged towards the web by leaf spring means positioned on the opposite side of the strap from said web and engaging a convex surface of the strap.

4,940,184

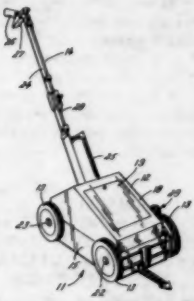
SPRAYING APPARATUS WITH SPEED INDICATING ASSEMBLY

Thomas J. Smrt, Cary, Ill., assignor to Fox Valley Systems, Inc., Cary, Ill.

Filed Mar. 30, 1989, Ser. No. 330,456

Int. Cl.[5] B05B *1/28, 9/04, 15/00*; E01C *23/16*

U.S. Cl. 239—71 **9 Claims**



1. A movable marking apparatus for marking a supporting surface comprising: a housing member; wheel means rotatably mounted to said housing member for engaging the supporting surface and rolling on the supporting surface; handle means secured to said housing for controlling said housing and pushing or pulling the housing along the supporting surface; rotating means rotatably mounted to said apparatus for indicating the speed of the apparatus, said rotating means having an outer surface and being driven by said wheel means, said rotating means including a first set of indicia disposed in spaced intervals on the outer surface, said first set of indicia appearing to be a solid line at a first, predetermined speed.

4,940,185

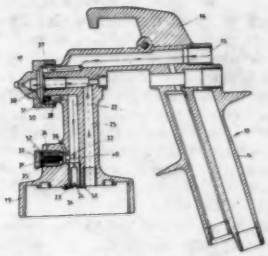
SAFETY EXHAUST VALVE EQUIPPED SPRAY GUN

Hsueh-Chin Fu, No. 1, Lane 18, Ta Wei Rd., Ta Li Hsiang, Taichung Hsien, Taiwan

Filed Dec. 9, 1988, Ser. No. 282,238

Int. Cl.[5] B05B *7/32*

U.S. Cl. 239—126 **2 Claims**



1. A safety exhaust valve equipped spray gun, which comprises a spray gun incorporated with a spray bottle cover in one solid unit above a connecting portion connecting said one solid unit to a bottle body, said spray bottle cover including a safety exhaust valve means for exhausting excess air pressure and an air induction means for maintaining pressure within a limited value;

said exhaust valve means including an adjusting bolt threaded into a wall of said spray bottle cover with a nut

fixed thereon, said wall having an exhaust hole on its top side; and a lever coupled to said adjusting bolt through a spring, said lever having a steel ball covering an air hole communicating with said exhaust hole; and

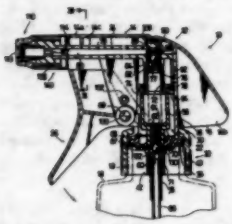
said air induction means including an air induction hole provided inside said spray bottle cover and having a bolt threaded therein at its bottom, said bolt providing a stepped hole means for permitting air below 50 psi to pass therethrough, exhausting excessive air pressure through said exhaust hole and controlling air pressure inside said bottle body within said limited value, said stepped hole means including a stepped hole with an inner diameter about 0.3 mm at its upper portion and a wider diameter at its lower portion, a check leaf at its bottom with one end of said check leaf fixedly attached adjacent to said stepped hole and with another end freely arranged, said check leaf having a circular convex portion blocking a bottom end of said air induction hole.

4,940,186

MANUALLY OPERATED TRIGGER TYPE DISPENSER, A SPINNER FOR USE IN THE DISPENSER, AND A FLOW-PATTERN SWITCHING MECHANISM FOR USE IN THE DISPENSER

Atsushi Tada, 2-6-3 Kakinokizaka, Meguro-ku, Tokyo, Japan

Filed Oct. 18, 1988, Ser. No. 259,274
Int. Cl.[5] B05B *11/00, 1/34*
U.S. Cl. 239—337 **7 Claims**



1. A manually operated trigger type dispenser, comprising:

a dispenser body made of a synthetic resin and including an upper portion and a lower portion vertically extending from the upper portion;

a bottle cap made of a bottomed hollow cylinder, for detachably coupling said lower portion of said dispenser body with a neck of a container filled with a liquid to be dispensed;

a cylinder defining a pump chamber and engaged with a swingable trigger, so as to reciprocate between an upper operational position and a lower non-operational position when said trigger is squeezed and released;

a substantially L-shaped piston made of a synthetic resin and including a horizontal nozzle interposed within the upper portion of said dispenser body, and a vertical piston body located within the lower portion of said dispenser body, for guiding said cylinder;

inlet conduit means formed within said cylinder and connected to said pump chamber through a primary valve, for supplying the liquid from said container into said pump chamber;

a nozzle cap having an orifice and attached to a distal end of the nozzle of said piston;

outlet conduit means formed within the nozzle of said piston and connected to said pump chamber through a secondary valve, for dispensing the liquid pressurized within said pump chamber, through the orifice of said nozzle cap; and

a return spring biasing said cylinder to the lower non operational position thereof; and

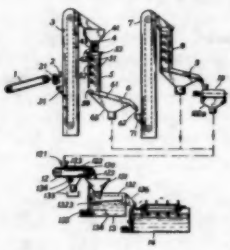
said lower portion of said dispenser body having a slit in the front section of a lower end of said lower portion to allow the passage of said L-shaped piston and the rear end of said trigger through said slit, and an engagement member fitting the lower end of said dispenser body in a proximal end of said bottle cap, by utilizing the elasticity imparted to the lower end of said dispenser body due to the existence of said slit, thereby holding the proximal end of said bottle cap between the lower edge of the rear section of said lower portion of said dispenser body and said engagement member.

4,940,187

SYSTEMATIC EQUIPMENTS FOR RECYCLING RAW MATERIALS FROM WASTE WIRES

Tocew Lee, P.O. Box 10160, Taipei, Taiwan

Filed Oct. 26, 1989, Ser. No. 426,980
Int. Cl.[5] B02C *21/00*
U.S. Cl. 241—79.1 **6 Claims**



1. A set of systematic equipments for recycling raw materials from waste wires comprising:

a charging conveyor handling waste wires having a cutter for cutting each waste wire in a predetermined length;

at least a vertical conveyor for carrying cut waste wires upwardly and unloading into a quantitative distributing means from a top portion of the vertical conveyor;

at least a vertical scraping machine having a plurality of scraping roller set consecutively vertically mounted in a vertical housing of said vertical scraping machine for scraping off plastic coatings of insulated copper wires;

at least a screening machine for filtering off fine wire scraps and for picking up stripped copper wire sections from an inclined screen formed in said screening machine;

a horizontal crushing machine receiving coarse wire scraps from said screening machine and crushing the scraps into particles or powder of copper, ferrous material and plastic materials;

a magnetic separator receiving the materials from said horizontal crushing machine and magnetically attracting the ferrous material to be separated from the copper and plastic materials;

a copper and plastic material classifier separating copper and plastic materials discharged from the magnetic separator; and

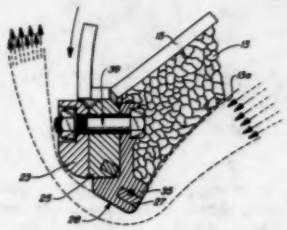
a wet gravity separator gravitationally classifying and separating the different plastic materials from said copper and plastic material classifier, depending on different densities and floating heights of the different plastic materials floating in a water stream in said gravity separator.

4,940,188

TIP HOLDER FOR MINERAL BREAKER

John Rodriguez, and Damian Rodriguez, both of 135 Lindberg Ave., Ste. A, Livermore, Calif. 94550

Filed Dec. 24, 1987, Ser. No. 137,953
Int. Cl.[5] B02C *19/00*
U.S. Cl. 241—275 31 Claims



1. An improved tip holder for the rotor of a centrifugal mineral breaker having discharge ports through which mineral material is passed out of said rotor, the tip holder comprising

a projecting mounting member portion for removably securing said tip holder to a rotor of a centrifugal mineral breaker proximate a discharge port thereof, said mounting member portion having an inner mounting surface and an outer mineral-contacting surface, the distance therebetween being the thickness of said mounting member portion;

a step integrally formed on one end of said mounting member portion and projecting therefrom into the path of the mineral material stream being passed out of said rotor, said step having a top surface for contacting said discharging mineral material, said step forming at least a portion of a material retaining surface disposed adjacent to said top surface and oriented toward said mounting member portion, said material retaining surface being formed for retaining a built-up bank of mineral materials extracted from the stream of mineral materials being passed out of said rotor, said material retaining surface being capable of retaining and stabilizing in said bank mineral materials having diameters of varying sizes up to 100 mm., said step also having at least one recess formed longitudinally therethrough;

an insert of abrasion resistant material at least partially enclosed in each recess of said step; and

a supporting and mineral flow-directing flange depending from the step in the general direction of the flow of discharged material.

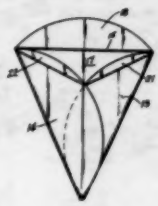
4,940,189

CONTAINER

Henry V. Cremonese, 125 Christopher St. #2H, New York, N.Y. 10014

Filed Aug. 1, 1988, Ser. No. 226,786
Int. Cl.[5] B65D *5/36*
U.S. Cl. 229—1.5 B 3 Claims

1. A container formed from a blank of generally circular form, two side panels folded over along fold lines which define first and second chords of said generally circular form, said side panels being affixed to each other to define a pocket having a base panel, another panel defined on said base panel by a third fold line which defines a third chord of said generally



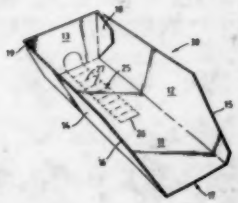
circular form and which is substantially co-terminal with said first and second chords.

4,940,190

CONTAINER

Maurice C. Groves, Brisbane, Australia, assignor to Amcor Limited, New South Wales, Australia

Filed May 16, 1989, Ser. No. 352,565
Claims priority, application Australia, Mar. 13, 1989, PJ3150
Int. Cl.[5] B65D *5/42*
U.S. Cl. 229—122 9 Claims



1. A tray for food such as a hotdog and the like, said tray having an open portion opposed to an end wall, said open portion enabling food to be presented for consumption, and two opposed side walls and a base panel from which said walls depend, said base panel having a portion between said side walls at least partially frangible therefrom, said frangible portion comprising a strip hinged at one end to said base panel at a location intermediate said end wall and said open portion and extending to said end wall at the opposite end, said frangible portion adapted to be urged by a user's finger from a position coplanar with the base panel to a position extending upwardly of the panel whereby when the frangible portion is moved to the extended position, the food within the tray can be moved towards the open portion by a user of the tray.

4,940,191

RECLOSEABLE BOX TOP LID

Timothy S. Dolby, 5 Till St., Enfield, Conn. 06082

Filed Mar. 29, 1989, Ser. No. 330,078
Int. Cl.[5] B65D *39/04*
U.S. Cl. 229—125 2 Claims

1. A reclosable box top lid which comprises:

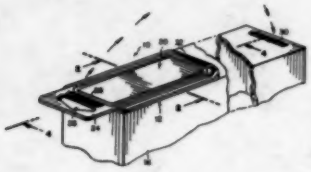
(a) a base secured to a top of an opening in a front end of a box;

(b) a cover pivotally secured to and received in said base;

(c) a frame secured in said box and providing frictional locking means for a forward portion of said cover; and

(d) a tab over-hangs said box and is integrally attached to said cover and provides finger gripping means for lifting and disengaging said forward portion of said cover, wherein said cover includes a continuous rib formed un-

derneath that engages with said frame that is fixedly secured in the opening in said front end of said box, and a forward portion of said rib frictionally engages with an angled forward portion of said frame and provides said frictional locking means, and said frame is fixedly secured



to inside surfaces of said box wherein said base is fixedly secured to said front end of said box and said rib is removably received in an opening through said base, and a loop is formed in an end portion of said cover and provides hinge means for pivoting said cover.

4,940,192

PACKAGE TRANSPORT APPARATUS FOR A TEXTILE MACHINE

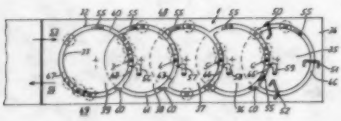
Wilhelm Kuepper, and Heinz Kamp, both of Wegberg, Fed. Rep. of Germany, assignors to W. Schlafhorst & Co., Fed. Rep. of Germany

Filed Mar. 30, 1989, Ser. No. 330,627

Claims priority, application Fed. Rep. of Germany, Mar. 30, 1988, 3810785

Int. Cl.[5] B65H *67/06*

U.S. Cl. 242—35.5 A **14 Claims**



1. In a textile machine of the type having a plurality of stations at which yarn packages are unwound and wherein packages to be unwound are transported in an advancing path along one side of the machine to the stations, transporting means comprising:

a plurality of generally horizontally disposed, partially overlapping, package supporting plates arranged in a sequential series;

means for moving each plate about a generally vertical axis with the surface of each plate moving along said one side of the machine through said advancing path and transversely of the machine through an associated station, each said plate partially overlapping the adjacent plate in the direction of package advance with the overlap extending through a portion of the package advancing path in advance of the station associated with the overlapping plate for selective transfer of advancing packages from one plate to the next along the package advancing path.

4,940,193

SAFETY BELT RETRACTOR WITH IMPROVED DAMPENING

Richard M. Grabowski, Lockport, Ill., assignor to Gateway Industries, Inc., Olympia Fields, Ill.

Filed Jan. 26, 1989, Ser. No. 303,283

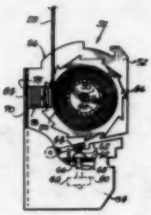
Int. Cl.[5] B60R *22/40, 22/04*

U.S. Cl. 242—107.3 **17 Claims**

1. Safety belt retracting apparatus for use in a vehicle having at least one door and a chassis, said apparatus comprising:

a safety belt retracting mechanism including a reel about which a web of the safety belt is wound and which is adapted to rotate to take up and let out said web and

a resiliently-compressible bellows device adjacent said reel



having a web-engaging surface which is spaced from said reel so that said bellows device is compressed by said web as said web is taken up on said reel with said bellows device applying a tension to said web during said take-up.

4,940,194

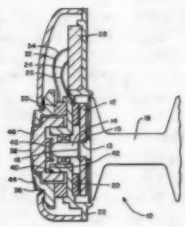
ELECTRONIC CASTING BRAKE

John N. Young, Fairfax, Calif., assignor to Pacific Products, Kentfield, Calif.

Continuation-in-part of Ser. No. 108,951, Oct. 16, 1987, abandoned. This application Dec. 8, 1988, Ser. No. 281,449

Int. Cl.[5] A01K *89/155, 89/033*

U.S. Cl. 242—288 **12 Claims**



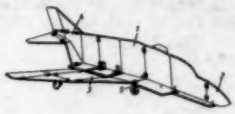
1. A casting reel, which comprises a reel housing, a reel spool shaft rotatably mounted in said reel housing, a sensing element coupled to said rotatable shaft for producing an output signal in response to rotation of said rotatable shaft, a control circuit connected to receive the output signal from said sensing element, said control circuit including means for producing a drag signal which varies in level and in time of initiation based on the output signal from said sensing element, and a variable drag means coupled to said reel spool shaft, said variable drag means being responsive to the drag signal from said control circuit in a self regulating arrangement both as to extent of braking action and a change of delay in time of initiating braking action of said variable drag means after rotation of said rotatable shaft begins, said sensing element comprising a magnetic member rotatable with said shaft and a fixed electrical coil positioned adjacent to a path of rotation of said magnetic member, said electrical coil and said magnetic member also comprising said variable drag means, said electrical coil being connected to receive the drag signal from said control circuit, said electrical coil and said magnetic member further comprising a generator providing power for said control circuit and said variable drag means, said casting reel being free of a battery and a power supply external to said casting reel.

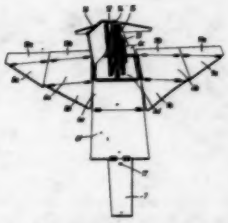
4,940,195

DECOY AIRCRAFT

David H. Jackson, Lower Ashtead, United Kingdom, assignor to Hoybond Limited, London, United Kingdom

Filed Jan. 4, 1989, Ser. No. 293,230
Claims priority, application United Kingdom, May 5, 1988, 8810604
Int. Cl.[5] B64C 00/00
U.S. Cl. 244—1 R 10 Claims





1. A decoy aircraft construction able to be of compact format during transport and to form a decoy model of an aircraft on disposition on an airfield, comprising:

six primary panels joined at edges thereof to comprise an enclosure box blank, and a plurality of secondary structures selected from secondary panels and secondary panels complexes formed of a plurality of panels hinged together, the secondary structures being hinged to respective primary panels to form a unitary structure, with up to all six of the primary panels having a said secondary structure hinged thereto, each secondary structure, when folded against its associated primary panel, having overall dimensions smaller than those of the said primary panel, wherein each of said secondary structures is able to be housed in a box formed from said box blank;

secondary panel shape and location on the primary panels and, when unfolded, secondary panel complex shape and location on the primary panels being such that, on converting said box blank with secondary structures attached to respective primary panels to an opened-out format of primary panels, the secondary structures augment the primary pane format to impart to the opened-out format a three dimensional shape simulating the shape of an aircraft construction.

4,940,196

WING MOUNTING NACELLE FOR A VERY HIGH BY-PASS RATIO TURBOJET AERO-ENGINE

Alain M. J. Lardellier, Melun, France, assignor to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A., Paris, France

Filed Oct. 28, 1988, Ser. No. 263,874
Claims priority, application France, Oct. 28, 1987, 87 14898
Int. Cl.[5] B64D 27/18
U.S. Cl. 244—54 10 Claims

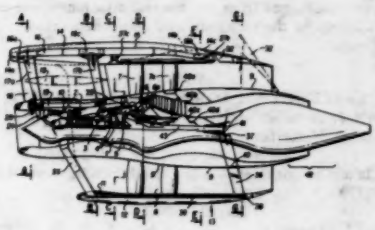
1. A nacelle for a turbojet by-pass engine unit of the rear contrafan type including a gas generator, two overlapping free contra-rotating turbines driven by said gas generator, an engine casing surrounding said gas generator and said turbines, and two ducted contra-rotating propellers rigid with said turbines downstream of said gas generator and disposed in a cold flow path of the engine unit outwardly of said engine casing, said nacelle mounting said turbojet engine unit under the wing of an aircraft and comprising:

an inner cowling of generally cylindrical shape surrounding said engine casing and forming the inner wall of said cold flow path, said inner cowling being openable to provide access to said engine,

an outer cowling which is also of generally cylindrical shape and which has an inner side defining the outer wall of said cold flow path and an outer side forming the exterior of the nacelle,

a mast for suspending said turbojet engine unit, said mast comprising two arms disposed in a vertical plane containing the longitudinal axis of said turbojet engine unit, said arms having upper and lower ends, and a fairing containing said arms,

joining means for connecting said upper ends of said arms to a box structure of said aircraft wing, and



a horizontal carrier beam disposed longitudinally between said engine casing and said inner cowling, said carrier beam being rigidly connected to said lower ends of said arms wherein said outer cowling is divided into three 120° sectors, one of said sectors being disposed uppermost and symmetrically relative to an axial vertical longitudinal plane of the turbojet engine unit and each of said sectors extend from a front portion to a rear portion of said outer cowling, and wherein two lateral sectors of said outer cowling comprise movable cowls which can be pivoted laterally about longitudinal pivot hinges fixed on said upper sector and wherein longitudinal edge portions of said lateral sectors can be connected together at a bottom portion thereof in a closed position and said outer cowling includes an annular retaining structure.

4,940,197

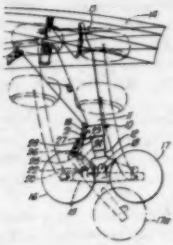
AIRCRAFT UNDERCARRIAGE UNIT

Peter M. H. Putnam, Herts, United Kingdom, assignor to British Aerospace Public Limited Company, London, England

Filed Feb. 10, 1989, Ser. No. 308,712
Claims priority, application United Kingdom, Feb. 11, 1988, 8803134
Int. Cl.[5] B64C 25/10
U.S. Cl. 244—102 R 5 Claims

1. An aircraft undercarriage unit including leg means, bogie means, torque link means, at least one ground engaging wheel means and bogie tilt means, said leg means including extendable oleopneumatic shock absorbing means and pivotal attachment means for attachment to an aircraft, said bogie means coupled to said shock absorbing means for tilting movement with respect to said leg means, said torque link means including interconnected first and second link means, said first link means pivotally attached to said leg means and said second link means pivotally attached to said bogie means, the or each ground engaging wheel means being mounted on said bogie means remote from the coupling thereof to said shock absorbing means, characterised in that said torque link means including locking means for locking said first and said second link means together to form a rigid tie bar and said bogie tilt means whereby said bogie means will tilt about the locked torque link

means in response to extension of said shock absorbing means so that the or a ground engaging wheel may be located at an



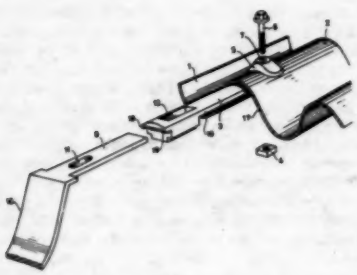
increased distance from the aircraft attachment means when the loading on the undercarriage unit is decreased.

4,940,198

BRACKET UNIT FOR FIXING A ROOF GUTTER

Gerrit J. de Wilde, Dedemsvaartseweg Noord 106, 7775 AK Lutten, Netherlands

Filed Nov. 14, 1988, Ser. No. 270,001
Claims priority, application Netherlands, Nov. 19, 1987, 8702770
Int. Cl.[5] E04D *13/06*
U.S. Cl. 248—48.1 12 Claims



1. A bracket unit for holding a gutter from a corrugated roof's eaves, said eaves having an underside, said bracket comprising:

an elongated supporting part having a supporting surface for engagement with the underside of said corrugated roof's eaves,

said elongated support part having a bore which runs therethrough for insertion of a bolt therein,

said bore having an axis which is perpendicular to a plane containing the supporting surface,

said bore having a cross-sectional area wherein the length of the cross-sectional area is greater than the width of the cross-sectional area, the length of the cross-sectional area running in the lengthwise direction of said elongated supporting part,

an insertion space in said supporting part,

a nut nesting space positioned in said bore, said nut nesting space holding and preventing a nut from turning when the bolt engages the nut, said nut nesting space allowing the nut limited movement in the lengthwise direction in said bore;

said nut positioned in said bore nut nesting space and engageable with said, bolt such that said bolt passes through the corrugated roof's eaves, through said bore and into said nut nesting space for engagement with said nut to hold said bracket unit to the underside of said corrugated roof's eaves; and

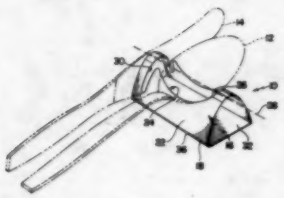
a bracket part having a first end for supporting a gutter and a second end for engagement with said insertion space of said supporting part such that the relative position of said supporting part and said bracket part is adjustable.

4,940,199

SUPPORT FOR EATING UTENSILS

Anson L. Hall, 22 Daggett Rd., Attleboro, Mass. 02703

Filed Jun. 23, 1989, Ser. No. 371,702
Int. Cl.[5] A47G *21/14*
U.S. Cl. 248—37.3 6 Claims



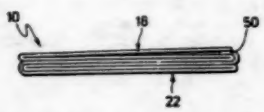
1. A support for eating utensils comprising an elongated support frame made from a substantially rigid sheet material and including elongated substantially parallel first and second edges and a central support portion extending upwardly from said first edge and then downwardly to said second edge, said central support portion having an aperture therein which is adapted for receiving and supporting an eating utensil, a first bottom wall hingeably attached to said support frame along said first edge and extending toward said second edge said first bottom wall and said support frame cooperating to define an open slot which extends along a portion of said first edge, a second bottom wall hingeably attached to said support frame along said second edge and extending toward said first edge, said second bottom wall being disposed beneath said first bottom wall, said support frame meeting said first bottom wall at an acute angle along said first edge and meeting said second bottom wall at an acute angle along said second edge, and tab means on said second bottom wall received in said slot for maintaining said support in an assembled position, said support frame, said first bottom wall, said second bottom wall and said tab means being integrally formed from a substantially flat rigid sheet.

4,940,200

SUPPORT FOR A NON-SELF SUPPORTING CONTAINER

W. David Sawyer, and Mark W. Sawyer, both of Indianapolis, Ind., assignors to Wilmarc, Inc., Indianapolis, Ind.

Filed Jan. 13, 1989, Ser. No. 296,623
Int. Cl.[5] A63B *55/04*
U.S. Cl. 248—97 12 Claims



1. A device for supporting a container, such as as a plastic trash bag, which is generally incapable of supporting itself in an open, upright position, comprising

an endless cardboard support having a plurality of panels including a first panel, a last panel, and four intermediate

panels including first, second, third, and fourth intermediate panels, each of the panels including a top edge, a bottom edge, a first side edge portion, a second side edge portion, an interior surface, and an exterior surface,

securing means for fixedly securing the first side edge portion of the first panel to the second side edge portion of the last panel, and

hinge means for hingedly connecting the four intermediate panels to each other along the side edge portions of the four intermediate panels, and for hingedly connecting the hingedly connected intermediate panels to the first panel and last panel along the side edge portions thereof.

wherein when the first panel, four intermediate panels, and the last panel are hingedly connected, the support can be moved between

a storage position wherein

(a) the interior surface of each of the first panel, four intermediate panels, and last panels are disposed in generally parallel planes,

(b) the exterior surface of the first panel and the first intermediate panel, and the exterior surfaces of the third and fourth intermediate panels are disposed in an opposed adjacent relation, and

(c) the interior surfaces of the first panel and third intermediate panel, the interior surfaces of the first intermediate panel and second intermediate panel, and the interior surfaces of the first panel and the fourth intermediate panels are disposed in an opposed adjacent relation, and

a use position wherein the panels form a generally endless tube capable of supporting itself in an upright position, and

having an interior defined by the interior surfaces of the first panel, four intermediate panels, and last panel for receiving the container.

4,940,201

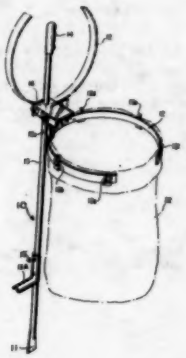
YARD PLASTIC BAG HOLDER

Orville Kurth, 271 Rangeline Rd., Mosinee, Wis. 54455

Filed May 8, 1989, Ser. No. 349,206

Int. Cl.[5] B65B *67/12*

U.S. Cl. 248—101 **5 Claims**



1. A yard plastic bag holder comprising a vertical bag support post, a split rectangular adjustment block slidable along said support post, a pair of bag support arms one of each of which is secured to a U-shaped bracket having a pair of parallel sides pivotally connected to said split block, pivot threaded bolt and nut connection means passing through said split adjustment block for adjusting said block along said support posts, and snap clips secured to said bag support arms and positioned thereon to engage the plastic bag and support same with its mouth open to receive trash.

4,940,202

STEPLESSLY ADJUSTABLE VERTICAL MOVEMENT DEVICE

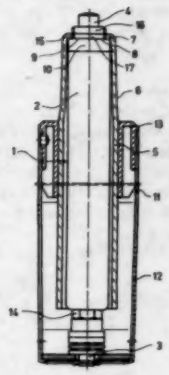
Hans-Josef Hosan, Neuwied, and Axel Knopp, Eitelborn, both of Fed. Rep. of Germany, assignors to Stabilus GmbH, Koblenz-Neuendorf, Fed. Rep. of Germany

Continuation of Ser. No. 312,402, Feb. 17, 1989, abandoned, which is a continuation of Ser. No. 142,243, Dec. 30, 1987, abandoned, which is a continuation of Ser. No. 29,358, Mar. 23, 1987, abandoned, which is a continuation of Ser. No. 783,771, Oct. 3, 1985, abandoned. This application Sep. 1, 1989, Ser. No. 403,915

Claims priority, application Fed. Rep. of Germany, Oct. 10, 1984, 3437097

Int. Cl.[5] F16M *11/00*

U.S. Cl. 248—162.1 **28 Claims**



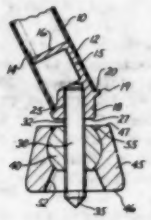
1. A steplessly adjustable vertical movement device for chairs, tables or the like articles, which comprises a blockable gas spring (1) having a container (2) and which is secured therewith in a telescopic tube (5), while a piston rod (3) emerging downwards from the container (2) and guided in sealed manner in relation to the interior of the container (2) is detachably connected with a guide tube (11) arranged on the telescopic tube (5) for sliding by means of a guide bush (13), while the telescopic tube (5) includes a taper (6) at its upper end for connection with a part of adjustable height and the guide tube (11) is connected with a foot part, and for the securing of the gas spring (1) in the telescopic tube (5) a connection is provided which presses the gas spring (1), for the formation of an axial stop, with an upper end face against a stop face situated on the taper end, one of said gas spring and said telescopic tube (1, 5) being provided with at least one first thread element (15) which, in the fitting of the gas spring (1) in the telescopic tube (5), cooperates with at least one second thread element (16) connected with the other of said gas spring and said telescopic tube (1, 5), said first and second thread elements (15, 16) in the assembled condition of said movement device being out of thread engagement and engaging each other with axially opposed, substantially axially directed thread end faces such as to define a traction abutment system (18), said thread elements (15, 16) being threadable with respect to each other in order to release said container (2) from said telescopic tube (5).

4,940,203

LEG PAD AND SPIKE FOR TRIPOD

Junichi Hayakawa, Tokyo, Japan, assignor to Velbon International Corporation, Torrance, Calif.

Filed Jun. 2, 1989, Ser. No. 360,998
Int. Cl.[5] F16M *11/20*
U.S. Cl. 248—188.9 10 Claims



1. An improved foot structure for a tripod for use in supporting a camera and the like comprising:

at least one leg having a longitudinal axis and a lower portion which is tubular,

means in the lower portion of said leg fixedly supporting a threaded spike oriented at an angle with respect to the axis of said leg,

a spherical ball element mounted on said threaded spike,

said ball element having an aperture therein and being threaded to mate with the threads of said threaded spike,

a pad element mounted on said ball and including an upper surface spaced from the lower portion of said leg and a lower surface adapted to engage the ground, and

means on said ball element and said pad to permit arcuate movement of said pad with respect to said ball and to effect rotation of said ball with respect to said spike as said pad is rotated.

4,940,204

INSTRUMENT HAVING FLEXIBLE STAND

Michael D. Nelson; Heimen Wong, both of Seattle, and Roger M. Trana, Bothell, all of Wash., assignors to John Fluke Mfg. Co., Inc., Everett, Wash.

Filed Sep. 28, 1989, Ser. No. 413,959
Int. Cl.[5] F16M *13/00*
U.S. Cl. 248—688 28 Claims

1. A stand for supporting the housing of a measurement instrument, comprising:

an elongated skeletal member extending outwardly from said housing and being formed of a material that is flexible, is non-brittle and has substantially no mechanical memory;

a thermoplastic polyester material covering at least a portion of said skeletal member; and

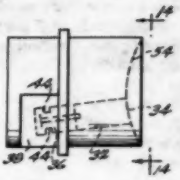
means for retaining one end of said stand to said housing.

4,940,205

DUPLEX LENS

Milo Rudd, 2119 NE. 15th Ter., Ft. Lauderdale, Fla. 33305, and Jerome Bakalar, 3660 Inverrary Blvd., Apt. M1J, Lauderhill, Fla. 33319

Continuation-in-part of Ser. No. 816,197, Jan. 6, 1986, Pat. No. 4,664,854. This application Apr. 6, 1987, Ser. No. 34,510
Int. Cl.[5] B29D *11/00*; B29C *39/12*
U.S. Cl. 249—63 3 Claims



1. An apparatus for molding a bifocal lens component comprising:

a fixed frame member;

a female mold supported in said fixed frame member, said female mold defining an aperture spaced from a central axis thereof and extending longitudinally therethrough;

a segment insert disposed within said aperture of said female mold; and

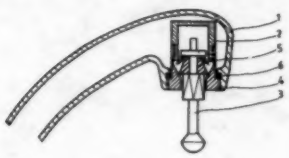
means operatively coupled to said insert for adjusting the position of said insert relative to said female mold, wherein said means for adjusting include an adjustment slide slidably received in said female mold for movement in a first direction, said adjusting means being coupled to said insert so that movement of said adjustment slide in said first direction urges said insert to move in a second direction, substantially perpendicular to said first direction, and wherein said insert is rigidly coupled to an actuator element which is slidably mounted to said adjustment slide, and wherein said adjustment slide includes a longitudinal recess, said actuator being slidably received in said recess.

4,940,206

FAUCET

Chung-Shan Sheen, 32, Ho Ping Rd., Hu Wei Town, Yun Lin Hsien, Taiwan

Filed Feb. 15, 1989, Ser. No. 310,867
Int. Cl.[5] F16K *21/16*, *31/00*
U.S. Cl. 251—52 8 Claims



1. In combination, a water faucet housing (1) having an undersurface equipped with an open (at 11);

an upstanding casing structure (2,4) seated in said opening, so that said casing structure is oriented vertically within the faucet housing;

said casing structure comprising an annular upstanding side wall, a roof wall extending across said side wall to form a cavity (21), a water flow hole means (42) extending through said side wall faucet housing into the casing structure, and an annular valve seat (at 43) located below

the plane of said flow hole means whereby water is enabled to flow downwardly from the casing structure through the valve seat;

a vertical stem (3) oriented on the axis of said casing structure, said vertical stem including an upper section located within the casing structure and a lower section located below the casing structure, the lower exposed section of the stem being adopted to be manually pushed or pulled to adjust the position of the stem relative to the casing structure;

an annular valve cock (5) carried on the upper section of said stem within the casing structure;

said valve cock comprising a lower collar (52) located below the general plane of the water flow hole means (42) for movement toward or away from the valve seat, and an upper collar (51) located above the general plane of the water flow hole means, said upper collar having a peripheral edge seatable against the inner surface of the casing structure above the flow hole means,

the inner surface of the casing structure side wall being spaced radially away from the outer edge of said upper collar in the vicinity of the flow hole means, so that when the upper collar approaches the plane of the flow hole means fluid can flow into or out of the cavity located above said upper collar;

said stem having a raised position wherein water flowing through the flow hole means exerts a buoyant effect on the lower face of the upper collar such that the lower collar is spaced above the valve seat;

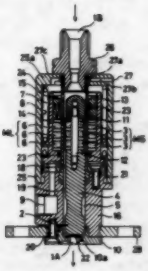
said stem having a lowered position wherein water pressure exerts a downward force on the valve cock sufficient to hold the lower collar against the valve seat.

4,940,207

AUTOMATIC VALVE

Kazuo Katsuyama, Toyota, Japan, assignor to Trinity Industrial Corporation, Tokyo, Japan

Filed Feb. 2, 1989, Ser. No. 305,205
Claims priority, application Japan, Feb. 29, 1988, 63-24975[U]
Int. Cl.[5] F16K *31/08, 31/122*
U.S. Cl. 251—65 **3 Claims**



1. An automatic valve comprising:

a valve chamber having at least two fluid ports, including one at a top end thereof and another at a rear end thereof, and an inner circumferential wall surface between said ends thereof;

a valve shaft contained in the valve chamber for sliding in the axial direction of said valve shaft and valve chamber, said valve shaft having a top end and a back end, and an outer circumferential wall surface between said ends thereof;

said valve shaft having a valve body formed at said top end thereof for closing one of said fluid ports and having a first cylindrical multi-layered magnet attached at said rear end of said valve shaft and comprising a first plurality of axially stacked ring magnets, said first cylindrical multi-layered magnet having a radially outer circumferential surface;

a cylinder disposed outside of and coaxially with said valve chamber;

a piston disposed axially slidably within said cylinder and adapted to move in a direction for opening the valve by application of pressure of a pressurized gas thereto;

a second cylindrical multi-layered magnet comprising a second plurality of axially stacked ring magnets, which is integrally constituted as a part of said piston, said second cylindrical multi-layered magnet having a radially inner diameter which is larger than the radially outer diameter of said first cylindrical multi-layered magnet, and said second cylindrical multi-layered magnet being arranged coaxially with the first cylindrical magnet such that the respective ring mag nets in the first cylindrical magnet and the respective ring magnets in the second cylindrical magnet are radially opposed to each other with different magnetic polarity; in which:

the respective ring magnets are stacked in each of the first and the second cylindrical magnets such that identical magnetic poles are faced to each other in each axially adjacent pair of ring magnets, and

the respective ring magnets in the second cylindrical magnet are so situated that they are axially displaced slightly toward the direction of closing the valve relative to the respective radially opposed ring magnets in the first cylindrical magnet with different magnetic polarity;

said valve chamber comprising a cylindical inner wall defining therein a flow channel extending from said one fluid port formed at said top end to said other fluid port formed at said rear end of said valve chamber, and

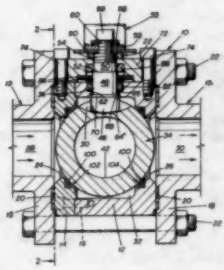
said flow channel being formed axially linearly between said inner circumferential wall surface of said valve chamber and said outer circumferential surface of said valve shaft and said outer circumferential surface of said first cylindrical magnet.

4,940,208

BALL VALVE

Willard E. Kemp, Houston, Tex., assignor to Kemp Development Corporation, Houston, Tex.

Division of Ser. No. 295,744, Jan. 10, 1989, Pat. No. 4,899,960.
This application Aug. 22, 1989, Ser. No. 397,508
Int. Cl.[5] F16K *5/06*
U.S. Cl. 251—315 **8 Claims**



1. In a ball valve having a body defining an enlarged diameter valve chamber with a floating ball valve member mounted therein, a stem connected to said ball valve member for rotation of said ball valve member between open and closed positions, and an outer clamping plate secured to said body for securing said stem on said valve body with said stem extending through aligned openings in said body and said plate;

improved mounting means for said stem comprising:

a packing mounted within said opening in said body about said stem;

a follower engaging the outer end of said packing;

a spring mounted within said aligned opening in said outer plate about the stem and biased between the outer plate and said follower for continuously exerting a compressive loading against said packing;

a thrust bearing mounted within said aligned opening in said outer plate at a location outwardly of said spring positioned between opposed facing surfaces on said stem and said plate extendingin a direction perpendicularly to the axis of rotation of said stem; and

an adjusting nut threaded onto said stem outwardly of said plate for urging said opposed facing surfaces toward each other to provide a predetermined compressive loading on said thrust bearing.

4,940,209

LEVERED FLUID DRAIN VALVE

Robert D. Fish, 330 S. Mentor #134, Pasadena, Calif. 91106

Filed Feb. 2, 1989, Ser. No. 305,070

Int. Cl.[5] F16K *51/00*

U.S. Cl. 251—144 **2 Claims**

1. An apparatus for draining fluid from a fluid reservoir fitted for a drain plug, which apparatus comprises;

a normally closed drain valve;

the valve housed within a drain fitting not extending substantially farther from the fluid reservoir than would the drain plug;

the drain fitting having an axially disposed drain passageway with at least two ends, means on one end thereof for mounting the drain fitting onto the reservoir, and means on another end thereof for receiving;

a removable actuator having at least one wall, an axially disposed actuator passageway with at least two ends, and a means for inserting on one end thereof which mates with the means for receiving on the drain fitting, to fluidly couple the two passageways;

a lever having a first side, a second side and a pivot between the two sides, the lever sized, dimensioned and positioned such that the action of mating the actuator to the drain fitting causes the first side of the lever to be pushed away from the valve and the second side of the lever to be pivoted towards the valve to open the valve;

the lever further being mechanically advantaged such that upon mating of the actuator to the drain fitting, travel of the actuator upon the drain fitting is smaller than the corresponding travel of the second side of the lever.

4,940,210

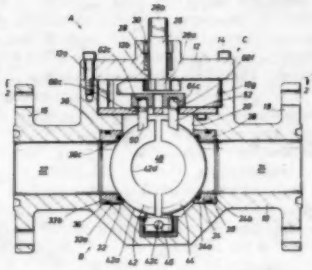
BALL VALVE

Hugh L. Gilmore II, 9305 Glynn La., Beaumont, Tex. 77707

Filed Mar. 24, 1988, Ser. No. 172,478

Int. Cl.[5] F16K *5/20*

U.S. Cl. 251—160 **9 Claims**



1. Valve apparatus for controlling the flow of fluid through a flow conduit comprising:

a valve body having a valve chamber and opposed flow passages communicating with said valve chamber to form a fluid flow path therethrough;

a valve closure having a central port therethrough mounted in said valve chamber for rotation between open and closed positions relative to said fluid flow path, said valve closure including a pair of opposed generally similar ball shaped hemisphere portions connected to each other adjacent one end about a pivotal connection for pivotal movement between an expanded position away from each other and a contracted position toward each other;

an annular valve seat about each flow passage at the juncture of the flow passage with the valve chamber for selective sealing engagement with an associated ball shaped portion;

an outwardly extending key member secured to each ball shaped hemisphere portion adjacent the other end thereof opposite said pivotal connection;

a non-rising stem extending from said valve body and mounted for relative rotation; and

linkage means operatively connected between said stem and the key members for rotating said ball shaped portions and moving said ball shaped portions between expanded and contracted positions during rotation of said stem, said linkage means upon rotation of the stem in one direction effecting movement of said ball shaped portions to expand position for sealing engagement with the valve seats at said closed position of the valve closure and effecting movement of said ball shaped portions to contracted position upon rotation of the stem in an opposite direction from said closed position of the valve closure;

said linkage means including a pair of guide members mounted for movement in a lateral direction extending generally perpendicularly to the axis of rotation of said stem upon rotation of said stem adjacent the closed position of said valve closure, said guide members operatively connected between said stem and said key members for effecting rotation of said associated ball shaped portions upon rotation of said stem.

4,940,211

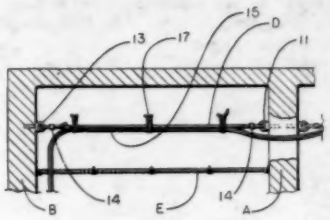
PROCESS FOR BUILDING WIRE

Samuel R. McGuire, 11 Charlbury St., Greenville, S.C. 29607

Continuation of Ser. No. 550,924, Nov. 10, 1983, abandoned. This application Aug. 26, 1985, Ser. No. 770,351

Int. Cl.[5] B65H *59/00*

U.S. Cl. 254—134.3 R **8 Claims**



1. A process for installing low voltage wiring on the interior of a building structure without the use of metallic conduit or raceways, comprising the steps of:

Stringing messenger cables from a central floor location to diverse floor locations, said messenger cables being attached to structural building components in a space above interior wall structures between structural ceilings and interior ceilings of the building structure;

Stringing a plurality of wires having fireproof insulation thereon from said central floor location to diverse locations by attaching said wires to said messenger cable with fireproof attaching means; and

Draping said wires from said diverse locations to interior wall locations.

4,940,212

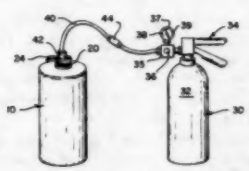
COMPACT CARBONATED BEVERAGE MAKING SYSTEM

John W. Burton, 4 Woodland Dr., Pittsburgh, Pa. 15228

Continuation-in-part of Ser. No. 296,502, Jan. 12, 1989. This application Jan. 9, 1990, Ser. No. 462,458

Int. Cl.[5] B01F *3/04*

U.S. Cl. 261—64.1 **24 Claims**



1. An apparatus for making carbonated beverages comprising:

(a) a reuseable bottle comprised of a top, a base and at least one wall attached between the top and the base which together define an enclosed space and at least one valve attached to said top having a single resealable passageway for repeated filling, pressurizing and emptying the bottle, said bottle being sized and constructed so as to be capable of retaining fluid at pressures above atmospheric pressure, said valve being capable of being opened by one of a filler probe and a discharge nozzle which engages the valve and pushes toward the enclosed space and said valve being closed when the valve is not pushed toward the enclosed space and when open said valve will permit a liquid to easily flow through said valve;

(b) a carbon dioxide source having a gas valve through which carbon dioxide may be dispensed upon actuation of the valve; and

(c) conduit connected between the valve of the carbon dioxide source and the valve of the bottle.

4,940,213

EXHAUST PROCESSING APPARATUS

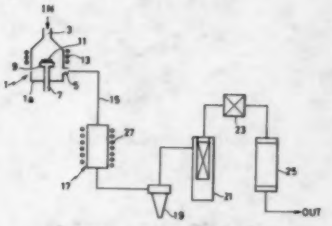
Toshimitsu Ohmine, Tokyo; Takaaki Honda, Numazu, and Keiiti Akagawa, Yamato, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Jul. 22, 1988, Ser. No. 222,905

Claims priority, application Japan, Aug. 24, 1987, 62-209799; Aug. 24, 1987, 62-209849; Aug. 24, 1987, 62-209850; Aug. 24, 1987, 62-209851; Dec. 9, 1987, 62-309563

Int. Cl.[5] B01D *46/00*

U.S. Cl. 266—152 **36 Claims**



1. An exhaust processing apparatus comprising:

a cracking furnace disposed on a discharging side of a reactor for cracking and solidifying part of unreacted source gases contained in exhaust emitted from the reactor which supplies source gases to a semiconductor substrate supported inside the reactor to grow crystals on the substrate and discharges the exhaust containing reacted source gases and the unreacted source gases;

first collecting means having a first member with a plurality of holes for collecting relatively large components solidified in said cracking furnace, said first collecting means being constructed to pass relatively small components and gases and to collect the relatively large components by colliding said relatively large components with a surface of said first member; and

second collecting means having a second member with a predetermined thickness in an exhaust gas outflowing direction and disposed downstream said first collecting means to arrest relatively small solidified components passed through said first collecting means, said second collecting means being constructed to pass gases and to arrest said relatively small components in said second member.

4,940,214

APPARATUS FOR GENERATING A VORTEX IN A MELT

John R. Gillespie, Ballwin, Mo., assignor to Gillespie & Powers, Inc., St. Louis, Mo.

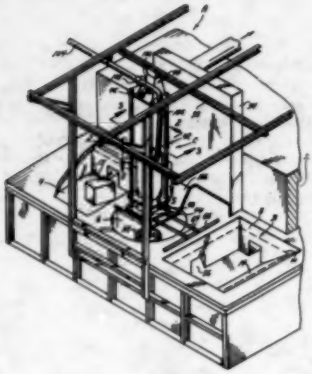
Division of Ser. No. 235,163, Aug. 23, 1988. This application Mar. 16, 1989, Ser. No. 324,041

Int. Cl.[5] C21D *11/00*

U.S. Cl. 266—235 **18 Claims**

1. An impeller for imparting a vortex to the molten metal of a melt, said impeller comprising a shank; a generally circular side wall located concentric to the shank and having a hollow interior which opens upwardly, the side wall having a radially outwardly presented surface provided with segments that are arranged circumferentially around the wall and deviate from a true circular configuration in that their midportions are set inwardly from it, the side wall also having apertures which open out of its at the segments and provide communication

between the hollow interior and the exterior of the impeller; and connecting means extended between the shank and the side



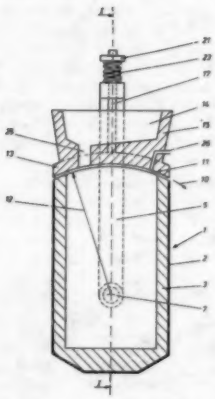
wall for joining the shank and side wall, so that the two will rotate as a unit.

4,940,215

TILTABLE LADLE WITH LID

Douglas S. White, Cap D'Antibes, France, assignor to Elkem a/s, Norway

Filed Jun. 30, 1989, Ser. No. 374,965
Claims priority, application Norway, Aug. 4, 1988, 883454
Int. Cl.[5] C21B *11/00*
U.S. Cl. 266—275 14 Claims



1. A cover for a tiltable ladle wherein said cover has a basin affixed to the top of said cover and at least one opening in the basin for communicating through said cover to said ladle, said cover comprising:

(a) a suspension means for suspending said cover over said ladle, said suspension means comprises a horizontal beam affixed to said suspension frame, and two rods, each of which is attached to said cover and passes through said horizontal beam and is movable with respect to said horizontal beam, each of said two rods having a washer affixed thereto and positioned above said horizontal beam;

(b) spring means for forcing said cover away from said ladle such that when the basin in said cover is empty said cover is not in contact with said ladle, said spring means attached to said suspension means, said spring means comprising two compression springs, one of said compression springs positioned around one of said two rods and between said horizontal beam and said washer and the other of said two compression springs positioned around the other of said two rods and between said horizontal beam and said washer; and

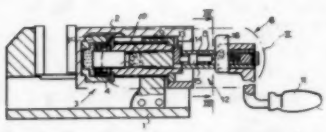
(c) the top of the ladle and the lower part of the cover have, in the tilting direction of the ladle, a curved surface with a radius equal to the distance from the tilting point of the ladle and vertically to the top of the ladle.

4,940,216

MACHINIST'S VISE

Ludwig Pflüger, Bitburg/Mötsch, Fed. Rep. of Germany, assignor to Carl U. Peddinghaus, Wuppertal-Barmen, Fed. Rep. of Germany

Filed Sep. 20, 1988, Ser. No. 247,109
Claims priority, application Fed. Rep. of Germany, Sep. 30, 1987, 3732900
Int. Cl.[5] B23Q *3/08*
U.S. Cl. 269—32 6 Claims



1. A vise comprising:

a stationary jaw;

a movable jaw displaceable longitudinally toward and away from the stationary jaw;

a nut fixed on the stationary jaw;

an outer hollow high-speed spindle threaded in the nut and formed with a radially open entrainment recess;

an inner low-speed spindle threaded in the outer spindle;

a piston-and-cylinder unit on the movable jaw having primary and secondary pistons respectively engaged by the outer and inner spindles;

a hand crank rotationally fixed on the inner spindle;

an entrainment pin displaceable transversely in the inner spindle between an entrainment position engaged in the recess and rotationally coupling the inner and outer spindles to each other and a freeing position clear of the recess and permitting relative rotation of the inner and outer spindles, the entrainment pin being formed with a longitudinally directed camming surface;

a switching piece displaceable on the inner spindle between a high-speed position and a low-speed position;

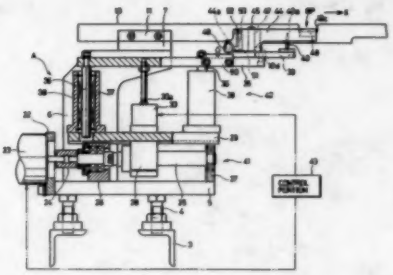
means including an operating bolt displaceable along the inner spindle and engageable with the entrainment pin and with the switching piece for pressing the operating bolt into the camming surface in the low-speed position of the switching piece and thereby pulling the entrainment pin out of the recess to decouple the spindles and for freeing the operating bolt from the camming surface and coupling the spindles to each other in the high-speed position of the switching piece.

4,940,217

LEAD FRAME CONVEYING APPARATUS

Osamu Takeshita; Takayuki Iwai, and Kenichi Terauchi, all of Kyoto, Japan, assignors to Dainippon Screen Mfg. Co., Ltd., Japan

Filed Jan. 6, 1989, Ser. No. 294,373
Claims priority, application Japan, Jan. 6, 1988, 63-839
Int. Cl.[5] B23Q 1/06
U.S. Cl. 269—50 24 Claims



1. A lead frame conveying apparatus for conveying a lead frame to a bonding position, the lead frame having a positioning hole of a first dimension, the conveying apparatus comprising:

lead frame mounting means for mounting the lead frame to the conveying apparatus;

transverse conveying means disposed below said lead frame mounting means and having a projectable portion which can be inserted into the lead frame positioning hole for conveying the lead frame toward the bonding position in a transverse direction by moving said projectable portion in the transverse direction,

said projectable portion including a tapered portion at an upper end thereof, said tapered portion including a largest portion having a second dimension larger than said first dimension of said positioning hole; and

elevating means coupled to said transverse conveying means for elevating said projectable portion upward at a first position along said transverse direction and for lowering said projectable portion downward at a second position along said transverse direction in a manner which, upon insertion of said projectile portion into said lead frame positioning hole and conveying said projectable portion to and from said first and second positions, will cause at least a portion of said lead frame to be raised from said lead frame mounting means and to be lowered on said lead frame mounting means at the bonding position.

4,940,218

ORTHOPEDIC OPERATING TABLE FOR LIMBS, AND IN PARTICULAR FOR THE LOWER LIMBS

Patrick Akcelrod, Sens, France, assignor to Societe Anonyme dite: Etablissements Tasserit, Gron, France

Filed Aug. 17, 1988, Ser. No. 232,986
Claims priority, application France, Oct. 5, 1987, 87 13708
Int. Cl.[5] A61G 13/00
U.S. Cl. 269—322 9 Claims

1. An orthopedic operating table for the limbs of a person, in particular the lower limbs, the table having a source of radiographic radiation and a radiographic image receiver in juxtaposition thereto and comprising:

a stand suitable for being positioned on the ground;

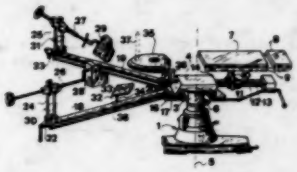
a base mounted on the top of said stand;

at least one flap for supporting the trunk of said person;

support means for attaching said flap to one side of said base so that said flap is offset relative to said base;

at least one beam comprising a central portion having a first end and a second end, said central portion being in the form of a hollow circularly cylindrical tube made of a material which is transparent to radiographic radiation emitted by a radiation source;

means for pivotally mounting said beam to said base in the proximity of the point where said limb joins the trunk of the person, to the other side of the base opposite to the side on which the support means for said flap are disposed with the distance between said beam when in a position substantially parallel to said ground on which said stand is suitable for being positioned, and said beam being greater in height than the height of one of said source of radiographic radiation and said radiographic image receiver from said ground, said means for pivotally mounting said beam to said base comprising a projecting portion fixed to said base and a ball-and socket joint having a male portion constituted by a convex spherical portion fixed to said projecting portion of the base by a connection lug, and a



female portion constituted by an end piece fixed to said first end of said beam, the inside of said end piece being shaped in the form of a complementary concave hemispherical portion forming a half-cup including an opening through which said connection lug passes; and

controllable locking means for locking said ball-and-socket joint in a determined position and constituted by a brake shoe disposed in the proximity of the convex portion and including friction material on a face thereof facing the convex portion, a transmission rod constituted by a circularly cylindrical hollow tube made of a material transparent to the radiographic radiation having a first end of said rod cooperating with said shoe and a second end emerging from the second end of the tubular portion of said beam, and means for controlling the displacement of said transmission rod relative to said tubular portion forming said beam.

4,940,219

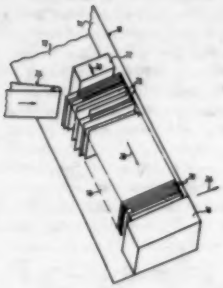
APPARATUS FOR FORMING A STACK OF FLAT OBJECTS SUCH AS LETTERS

Jean-Pierre Volat, Aix-En-Provence, France, assignor to Bertin & Cie, Plaisir, France

Filed Mar. 17, 1989, Ser. No. 325,229
Claims priority, application France, Mar. 18, 1988, 88 03592
Int. Cl.[5] B65H 31/00
U.S. Cl. 271—2 11 Claims

1. Apparatus for forming a stack of flat objects such as letters on a support in the form of a trough having two mutually perpendicular walls with each flat object bearing thereagainst via its leading edge and via one of its side edges with one of said walls also being a jogging wall, said apparatus including conveyor means for bringing flat objects one after another to the support at a predetermined orientation, close to the orientation the flat objects are to occupy in the stack; stacking means for stacking the flat objects on the support by sliding each flat object over the preceding flat object on the stack and moving it into abutment against a jogging wall of the support; and relative displacement means for obtaining displacement of the conveyor means and the stacking means relative to the stack and the support, the stacking means being loosely mounted relative to the stack; wherein the stacking means extends between the conveyor means and jogging wall, and includes an end close to said second jogging wall, said second end having

an axis about which said stacking means can pivot so that said stacking means is displaceable towards and away from the end



of the stack, and return means cooperating with said stacking means for urging the stacking means continually towards the stack.

4,940,220

SUPPORTING DEVICE

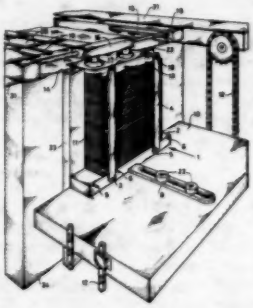
Lambertus M. Van Mechelen, Kleine Singel 39, 3572 CG Utrecht, Netherlands

Filed Mar. 1, 1989, Ser. No. 317,620

Claims priority, application Netherlands, Mar. 4, 1988, 8800550

Int. Cl.[5] B41L *47/00*

U.S. Cl. 271—2 **7 Claims**



1. Device for supporting a stack of sheet material on a feeder for a printer, particularly where each sheet has zones of uneven thickness, such as envelopes, said feeder being provided with:

a supporting table for the stack;

two or more vertical feed walls having vertical feed edges which are at an adjustable distance from each other and along which the table can move depending on the decrease in the stack;

a pick-up device above the table for essentially lateral removal of the top sheet of the stack each time;

a supporting plate which can be fixed on the supporting table characterized in that at the side facing away from the vertical feed wall, the supporting plate is provided with one or more bar-type supporting means which freely extend upwards along the stack, and that at its side facing the vertical feed wall, the supporting plate has a lip which fits closely and slides between the feed edges.

4,940,221

SUCTION-TYPE SHEET-SEPARATING DEVICE FOR A FEEDER OF A PRINTING PRESS

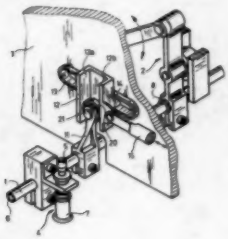
Arno Wirz, Bammental, and Detlev Krause, Hockenheim, both of Fed. Rep. of Germany, assignors to Heidelberger Druckmaschinen AG, Heidelberg, Fed. Rep. of Germany

Filed Dec. 23, 1988, Ser. No. 289,605

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1987, 3743805

Int. Cl.[5] B65H *3/08*

U.S. Cl. 271—107 **15 Claims**



1. Suction-type sheet-separating device for a feeder of a printing press with suction-type grippers for lifting off an uppermost sheet from a pile of sheets and for transferring the lifted-off sheet to transporting means for conveying the lifted-off sheet in a sheet travel direction towards a printing unit of the printing press, the suction-type grippers being disposed above the pile of sheets in the vicinity of a trailing edge of each sheet and when having suction air applied thereto initially gripping an uppermost sheet and then executing a prestroke to a first height, comprising a lifting gear drive and a horizontal carrying shaft parallel to the trailing edge of the sheet and carrying the suction-type grippers, the suction-type grippers being aligned with respect to said carrying shaft, said lifting gear drive serving, on an upward stroke and a downward stroke in phase with the printing press, to raise and lower, respectively, said carrying shaft on a substantially straight, vertical path in a manner that, on an upward stroke, the suction-type grippers are raised to a second height located above the first height, means for holding the carrying shaft in the lifting gear drive so that it is able to swivel about its own longitudinal axis and is rotationally rigidly connected, so as to be rigid against relative rotation, to a link for a swivelling device for selective swivel positions, and means for guiding said link substantially parallel to itself in the selectable swivel positions.

4,940,222

PAPER FEED DEVICE AND PAPER CASSETTE THEREFOR

Mikihiko Maeno; Yukio Ohta; Yoshiharu Momiyama; Hisao Ono; Katsumasa Takahata; Kazuyuki Ozono; Makoto Shimizu, and Mikio Yamamoto, all of Tokyo, Japan, assignors to Oki Electric Industry Co., Ltd., Tokyo, Japan

Division of Ser. No. 182,230, Apr. 15, 1988, Pat. No. 4,874,159. This application Feb. 15, 1989, Ser. No. 311,165

Claims priority, application Japan, Apr. 16, 1987, 62-92029; Apr. 16, 1987, 62-56711; Apr. 17, 1987, 62-57534; May 14, 1987, 62-70911; May 28, 1987, 62-79873

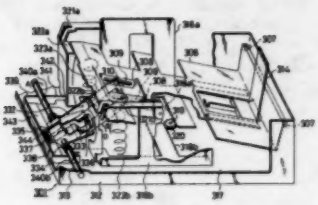
Int. Cl.[5] B65H *3/06*

U.S. Cl. 271—127 **2 Claims**

1. A paper cassette which stores a number of types of media on a media load plate, one end of which is journalled in such a way that it is able to rotate and the other end of which is rotated up and down by a reset arm, and performs paper feed with the medium pushed against a hopping roller by a spring which pushes the media load plate upwards, comprising

an auxiliary resilient member which pushes the reset arm up,

a sub-arm, one end of which abuts and stops said auxiliary resilient member and which rotates together with the auxiliary resilient member, and



a means provided in the rotation range of said sub-arm for regulating the rotation of said sub-arm according to the size of the medium by being able to move in accordance with the size of medium.

4,940,223

APPARATUS FOR RECEIVING AND ORDERLY STORING INDIVIDUAL SHEETS IN A CONTAINER

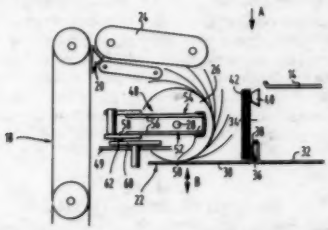
Peter Weigel, Paderborn Dorenhagen; and Guenter Holland-Letz, Paderborn-Elsen, both of Fed. Rep. of Germany, assignors to Nixdorf Computer AG, Paderborn, Fed. Rep. of Germany

Filed Feb. 24, 1989, Ser. No. 314,968

Claims priority, application Fed. Rep. of Germany, Mar. 15, 1988, 3808624

Int. Cl.[5] B65H *29/40*

U.S. Cl. 271—181 **12 Claims**



1. An apparatus for receiving generally rectangular individual sheets, especially bank notes, and for storing them in ordered condition in a container, which container is arranged in a housing and has a throughout opening connected with an input opening of the housing through a transport belt for the serial transport of the individual sheets, characterized in that said throughput opening of said container at least in the direction of one edge of said sheets is smaller than the corresponding measurement of said sheets, that at the end of said transport belt and in front of said throughput opening a stacking apparatus is arranged with a stack support surface extending perpendicularly to said throughput opening for forming a stack of sheets so that said sheets of said stack stand upright on said stack support surface and parallel to said throughput opening, and that a pusher is provided which is shiftable in the direction toward said throughput opening, by means of which pusher a sheet stack formed on said stack support surface can be pushed into said container through said throughput opening with accompanying bending of said sheet stack.

4,940,224

MULTIPLE DOCUMENT DETECTOR AND SEPARATOR

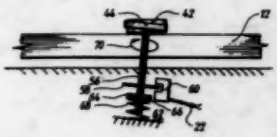
John Couper, West Lothian, Scotland, assignor to Unisys Corporation, Blue Bell, Pa.

Filed Dec. 14, 1988, Ser. No. 284,276

Claims priority, application United Kingdom, Mar. 23, 1988, 8806958

Int. Cl.[5] B65H *7/06*

U.S. Cl. 271—263 **12 Claims**



1. An apparatus for detecting simultaneous presentation of multiple documents and for separating said documents comprising:

a first document detector set including document moving means having a driven member for imparting motive force to a document; an idler member, opposed to said driven member and co-operative with said driven member to grip documents there-between; and a velocity monitor, said monitor monitoring relative peripheral velocity between said driven member and said idler member and providing a first output indicative of presentation of multiple documents when there is a difference between said relative peripheral velocities,

said driven member being operative to continue to provide said motive force after provision of said first output by said velocity monitor in order to cause separation between multiple presented documents,

said velocity monitor being operative to provide a second output indicative of completion of document separation when next said peripheral velocity of said driven member is equal to said peripheral velocity of said idler member,

further document moving means coupled to said velocity monitor for receiving said first and second output, said further document moving means receiving said document from between said driven member and said idler member and being responsive to said second output for moving said document with an increased linear velocity greater than said peripheral velocity of said driven member, said further document moving means being inhibited from removing a document from between said driven member and said idler member with said increased velocity until said velocity monitor provides said second output.

4,940,225

SHEET HANDLING APPARATUS

Shunji Sato, and Takeshi Hoajo, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 27, 1987, Ser. No. 90,103

Claims priority, application Japan, Aug. 29, 1986, 61-203394; Aug. 29, 1986, 61-203395

Int. Cl.[3] B65H *7/20*

U.S. Cl. 271—296 **15 Claims**

1. A sheet handling apparatus comprising:

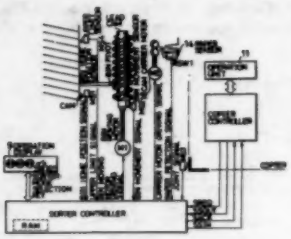
carrier means for carrying a sheet which is output from a sheet output unit;

handling means for handling the sheet carried by said carrier means;

detecting means for detecting a sheet carrier speed by said carrier means; and

control means for outputting a control signal in accordance

with the sheet carrier speed which is detected by said detecting means and a sheet carrier speed data of said



carrier means which is transmitted from said sheet output unit.

4,940,226

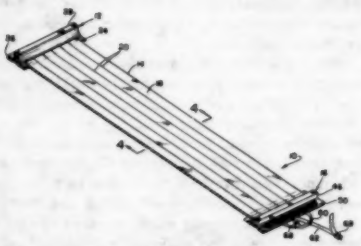
SIMULATED SKATING EXERCISING APPARATUS

Robert Carra, 8 Renee Rd., Syosset, N.Y. 11791

Filed Aug. 28, 1989, Ser. No. 398,929

Int. Cl.[5] A63B *21/00*

U.S. Cl. 272—70 **1 Claim**



1. For performing side-to-side alternating sliding movements in an exercise routine on an exercise device comprising an elongated rectangular body of a plastic construction material for permitting the rolling thereof into helical turns upon itself, to thereby provide a compact storage condition to said exercise device when not in use and having a low friction surface for permitting said sliding movements thereon along the long dimension of said body, a cooperating pair of first and second sliding movement stop members attached in a transverse orientation and in spaced apart relation to each other to said body so as to bound therebetween an operative sliding area for said exercise routine, said first stop member being fixedly attached to said body adjacent one end thereof and said second stop member being movable into a selected position of movement therealong incident to the attachment thereof to said body so as to establish a permissible length of the sliding movements in said operative sliding area, a cooperating pair of wedges disposed in an interposed position between said body and said stop members such that each said first and said second stop member is clamped to a cooperating wedge in the attachment of said members to said body, and said stop members having concave surfaces in facing relation to each other such that said wedges and said concave surfaces cooperate to cause an ascending movement in the terminal portions of said sliding movements to thereby contribute to terminating the directional nature thereof and causing a reversal therein, and spaced apart indentations in said body low friction surface so as to form a pattern of lines oriented lengthwise thereof so as to frictionally oppose transverse sliding movement without impeding lengthwide sliding movement, to thereby contribute to the tracking of said sliding movements between said stop members.

4,940,227

CANOE PADDLING EXERCISE MACHINE

Calvin T. Coffey, 48 E. Fifth St., Corning, N.Y. 14830

Filed Nov. 27, 1989, Ser. No. 441,285

Int. Cl.[5] A63B *69/06*

U.S. Cl. 272—72 **8 Claims**

1. A canoe paddling exercise machine comprising a longitudinal frame; a flywheel mounted on said frame; a seat on said frame on which a human subject is positioned for exercise, simulating canoe paddling motion by stroking an elongated handle against resistance on one or the other side of said frame, a flexible cord that attaches to said elongated handle, a pulley arm positioned at a front end of said longitudinal frame having an outer pulley over which said cord passes to said handle, and an inner pulley over which said cord passes from the outer pulley towards said flywheel; means connected with said cord, said flywheel and said frame for rotating said flywheel in one direction when said handle is stroked aftward to provide resistance to said subject, and to retract said cord towards said flywheel when said handle is recovered forward between strokes; and an axial pivot positioned on a forward end of said frame to permit said pulley arm to swing about a fore-and aft axis so that the outer pulley follows motion of the handle from one side of the frame to the other to produce a resistance during stroking of the handle that is directed substantially parallel to the frame axis, while the inner pulley remains positioned so that the cord passing therefrom towards said flywheel remains substantially in a predetermined path regardless of the position of the swingable pulley arm.

4,940,228

BOXING TRAINING DEVICE

Kordelia Horvath, Hallerstrass 5b, D-2000 Hamburg 13, and Victor Horvath, Hallerstrass 5b, 200 Hamburg 13, both of Fed. Rep. of Germany

PCT No. PCT/EP87/00205, § 371 Date Feb. 12, 1988, § 102(e) Date Feb. 12, 1988, PCT Pub. No. WO87/06149, PCT Pub. Date Oct. 22, 1987

PCT Filed Apr. 16, 1987, Ser. No. 148,217

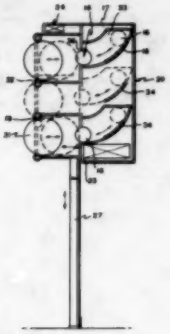
Claims priority, application Fed. Rep. of Germany, Apr. 16, 1986, 3612774

Int. Cl.[5] A63B *69/00*

U.S. Cl. 272—76 **10 Claims**

1. Boxing training device comprising a frame defining a reaction area, a measuring device for measuring punching effect, and at least two reaction bodies, the reaction bodies being freely movable within said reaction area as a means for taking up kinetic energy imposed thereon by the action of at least one boxing glove, said energy being dependent on punching force and punching direction, and for transmitting said energy to said measuring device, the measuring device being provided with sensors that are connected to indicating instruments and respectively associated with the reaction bodies, as a means for measuring and representing the punching effect

from the movement of at least one of the reaction bodies, wherein each reaction body is formed of an axially symmetrical body that is carried within a frame in a manner permitting relative, free rotational, displacement between the reaction



body and the frame; and wherein an axially symmetric, directly punchable, elastic body is movably arranged in front of the at least one reaction body in a manner enabling the elastic body to contact the reaction body in response to the elastic body being struck with a boxing glove.

4,940,229

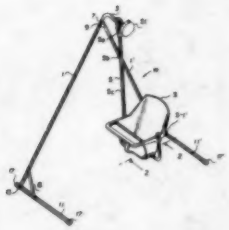
TWO-LEGGED BABY SWING

Edwin E. Foster, 1801 Camp Craft Rd., Austin, Tex. 78746

Filed Aug. 28, 1989, Ser. No. 399,015

Int. Cl.[5] A63G *9/16*

U.S. Cl. 272—86 **17 Claims**



1. A self-rocking, spring-powered swing comprising a frame, the frame having leg means, a base, and a support structure, the leg means having both upper and lower portions, the base joined to the lower portion of the leg means, the support structure joined to the upper portion of the leg means for being supported by the leg means anteriorly thereof in cantilevered relationship to the leg means, the support structure having a coupling means, a swing arm hanging from the support structure from a center of rotation located anteriorly of the leg means without need for additional leg structure anteriorly of the center of rotation, the swing arm being capable of swinging movement about the center of rotation by rotating axially about the support structure, a spring motor connected to the swing arm by a single bracket anteriorly of the support structure and the swing arm for imparting rocking motion to the swing arm, the bracket having both upper and lower portions, the lower portion of the bracket being connected to an upper portion of the swing arm, the upper portion of the bracket having an opening and extending to opposite the coupling means, and the spring motor being inserted anteriorly of the bracket through the opening of the bracket into the coupling means, such that the portion of the spring motor in the bracket is a moving portion and the portion of the spring motor coupled to the support structure is a stationary portion.

4,940,230

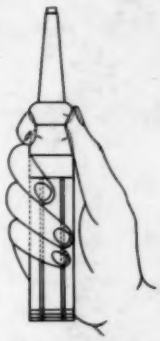
UNIVERSAL HANDLE

Du Jian, No. 120 Xidajie Gulou Xichengqu, Beijing, China

Filed May 13, 1988, Ser. No. 193,930

Int. Cl.[5] A63B *59/04*

U.S. Cl. 273—76 **6 Claims**



1. A handle for a sports racket, the handle being elongated and comprising, along the axis of elongation of the handle, a truncated spheroid disposed at an upper portion of the handle; a truncated ellipsoid of increasing cross-sectional dimensions from top to bottom joined to the lower portion of said spheroid at a slender neck; said neck defining the bottom of a groove extending around said handle, the groove bottom lying in a plane perpendicular to said axis of elongation, and the walls of said groove comprising convex surfaces of said spheroid and said ellipsoid; a cylindroid joined to the bottom portion of said ellipsoid; and a prism; joined to the bottom of said cylindroid the axial lengths of said cylindroid and said ellipsoid being such that, in use, the user's palm can grip said prism with the user's thumb and index finger each engaging both convex walls of said groove for preventing forwards or backwards slippage of the handle in the user's hand.

4,940,231

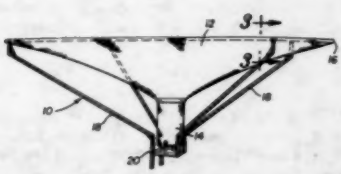
BALL RECEPTOR FOR BASKETBALL RETURN MACHINES AND THE LIKE

David G. Ehler, 560 S. Coors Ct., Lakewood, Colo. 80228

Filed Oct. 7, 1988, Ser. No. 255,059

Int. Cl.[5] A63B *63/08*

U.S. Cl. 273—1.5 A **19 Claims**



1. A ball receptor, comprising:

a flexible net body of generally conical shape having a depending flexible ball discharge tube;

a perimetric net frame carrying said net body and having a plurality of foldable hinges at spaced intervals about the

net frame, said hinges being oriented to permit folding the net frame in more than one plane; and

a plurality of support arms carrying said net frame.

4,940,232

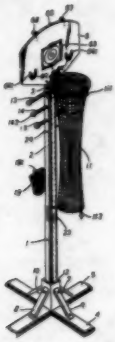
COMBINATION MULTIPURPOSE FRAME STRUCTURE

Darco Chen, No. 16, Chung Cheng 3rd Road, Pu Li Chen, Nan-tou Hsien, Taiwan

Filed May 11, 1989, Ser. No. 350,361

Int. Cl.[5] A63B *63/08*

U.S. Cl. 273—1.5 R **4 Claims**



1. A combination multipurpose frame structure adapted for use as a clothes stand, height measuring instrument and a basketball goal stand comprising:

a vertical stand including:

a lower stick;

a middle stick; and

an upper stick;

which are separably associated with each other end to end in consecutive order;

a pair of oblong boards orthogonally joined together by bolt means disposed at the bottom of the stand as a base;

four side supporting rods each inclinedly secured to said oblong boards with one end and the other end thereof fixed to the bottom of said lower stick in a symmetric manner;

said bottom of the lower stick is defined to have larger size than the lower stick itself and having a square cross section with a recess disposed on the wall thereof;

a backboard having a circular opening disposed at the center thereof so that a dartboard can be attached thereto;

a long basket net removably secured to said board and used as a basketball goal or as a disposal container for the laundry;

a basket removably attached to the rear side of said middle stick for the accommodation of small articles;

a number of hanging sticks disposed through holes placed on said upper and lower sticks so that clothes can be hanged thereon.

4,940,233

AEROBIC CONDITIONING APPARATUS

John Bull, 2 Viento, Irvine, Calif. 92720; Ian Fettes, 1001 W. 17th St., Costa Mesa, Calif. 92627, and Harry Purcell, 832 Alesenandro Ave., La Verne, Calif. 91570

Filed Feb. 19, 1988, Ser. No. 158,260

Int. Cl.[5] A63B *21/008*

U.S. Cl. 272—130 **3 Claims**

1. An aerobic exercising apparatus for use by a trainee in simultaneously exercising the arms and legs comprising:

(a) a base;

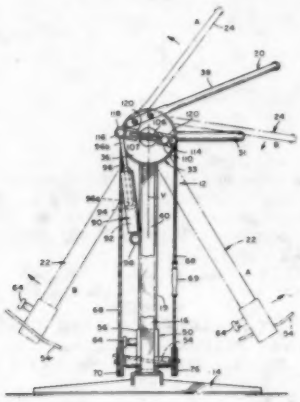
(b) first and second transversely spaced frames mounted on said base;

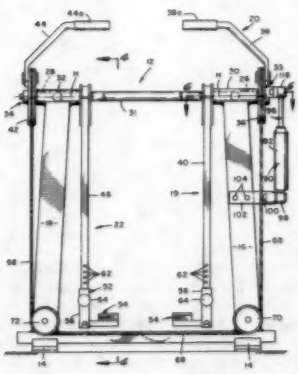
(c) first and second axles carried by said first and second frames for rotation about a substantially horizontal axis;

(d) first and second support assemblies connected to said first and second axles respectively for rotation therewith;

(e) first and second hand engaging means connected to said first and second support assemblies respectively for controlling the movement of each of the hands of the trainee to an oscillatory motion along an arcuate path;

(f) first and second foot engaging means connected to said first and second axles respectively for controlling the movement of each of the feet of the trainee to an oscillatory motion





along an arcuate path extending forwardly and rearwardly of said vertical plane;

(g) synchronizing means carried by said first and second frames for causing synchronous movement of said first foot engaging means and said first hand engaging means with said second foot engaging means and said second hand engaging means; and

(h) resistance means for yieldably resisting rotation of said first and second axles, said resistance means comprising:

(i) a hydraulic cylinder having a cylinder portion containing a hydraulic fluid, a piston reciprocally movable within said cylinder portion and an elongated connecting rod

having a first end connected to said piston and a second end spaced from said cylinder portion;

(ii) first means for pivotally connecting said cylinder portion to one of said first and second frames; and

(iii) second means for pivotally connecting said second end of said piston rod with one of said first and second support assemblies, said second means comprising adjusting means for pivotally connecting said second end of said piston rod with one of said first and second support assemblies at selected locations along a radius extending from said horizontal axis of rotation of said first and second axles.

4,940,234

VIDEO GAME MACHINE

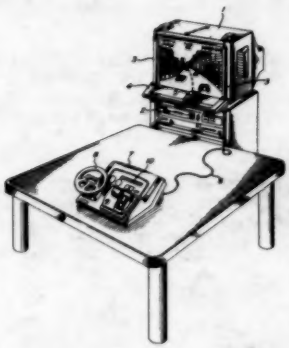
Nobuaki Ishida; Yoshifumi Ishimura, and Hiroshi Murayama, all of Tokyo, Japan, assignors to Sega Enterprises, Ltd., Tokyo, Japan

Filed Mar. 14, 1989, Ser. No. 323,298

Claims priority, application Japan, Jun. 15, 1988, 63-79389[U]

Int. Cl.[5] A63F *9/14*

U.S. Cl. 273—1 GA **11 Claims**



1. In a video system having a monitor screen to provide images, the improvement comprising:

means for attachment adjacent the monitor screen for providing a simulated vehicle that can be moved relative to the screen;

means for compound movement of the simulated vehicle, both across the screen and also pivoting the vehicle, so that a rear portion of the vehicle can move towards and away from the screen to simulate turning movements of the simulated vehicle relative to images on the monitor screen, and

means for permitting an operator to control the simulated vehicle movement, including an operator control member having an upper portion which can be manipulated by the operator and means connected to the lower portion of the operator control member for creating a vibration movement of the operator control member in response to certain predetermined actions of the operator, whereby the operator will feel an adverse reaction in the operator control member.

4,940,235

METHOD FOR PLAYING A BOARD GAME

Linda Martin, 1926 83rd Ave., Oakland, Calif. 94612

Filed Jul. 26, 1989, Ser. No. 385,802

Int. Cl.[5] A63F *3/00*

U.S. Cl. 273—236 **2 Claims**

1. A method of playing a board game with at least one die having a number on each of its faces by a plurality of players comprising the following steps:

providing a plurality of game board pieces;

selectively apportioning the game board pieces among the players whereby each player is apportioned selective game pieces;

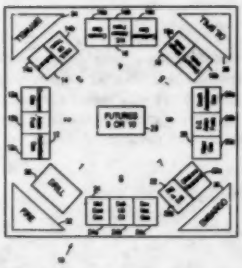
providing a plurality of instruction cards bearing instructions;

providing a game board having

a plurality of playing regions each having one of a plurality of preselected numbers corresponding to the numbers selected with the rolling of at least one die,

each of the playing regions further comprising a preselected number of boxes,

a card region having at least one unique number corresponding to a number selected with rolling at least one die wherein the unique number differs from the preselected plurality of numbers and the instruction cards are located in the card region,



at least one penalty region, and

an enter region;

rolling the die and assessing the number rolled;

introducing a new game piece onto the board in the enter region if the number on the die is a first number;

determining a total based upon the number rolled if a single die is used or if a plurality of die are used by totaling the numbers rolled if the number rolled is other than the first number;

selecting an instruction card if the total number is the unique number and carrying out the instruction on the selected card; and

moving a game piece from the enter region to one of the boxes in the playing region having the preselected number corresponding to the total number rolled when the total is other than the unique number.

4,940,236

COMPUTER GOLF CLUB

Dillis V. Allen, 240 Lincolnshire, Schaumburg, Ill. 60007

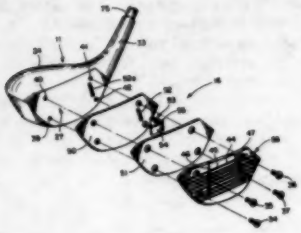
Filed Jul. 26, 1985, Ser. No. 759,358

Int. Cl.[5] A63B *53/04*

U.S. Cl. 273—183 D **13 Claims**

9. A golf club assembly with a self-containing ball distance computing and indicating device, comprising: a head having a forward wall generally perpendicular to an estimated line of ball flight after impact by the club head, said forward wall being curved in at least one orthogonal direction, a molecularly polarized flexible piezoelectric film mounted in a forward surface of the wall and conforming to the contour of the wall to provide a signal proportional to film compression, a face plate attached to the forward surface of the head wall carrying the piezoelectric film and conforming in contour to the head forward wall, said face plate having a ball striking surface said face plate being positioned to transmit substantially all of the impact force of a ball on the plate to the film, a shaft connected to the head, and circuit means for receiving the compression signal and deriving therefrom a signal proportional to the

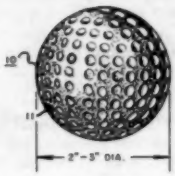
velocity of the ball after impact with the head, the forward wall on the face plate being curved in both orthogonal directions producing vertical roll and horizontal bulge, said piezoelectric film conforming in contour to the forward wall and face plate, circuit means in the shaft for receiving said compression signal and deriving a signal proportional to the velocity of the ball leaving the head after impact, said circuit means deriving from said ball velocity signal a signal proportional to ball travel, and indicating means in the shaft driven by the ball travel yards signal for providing a visual indication of ball travel.



4,940,237
GOLF SWING AID APPARATUS
Steven L. Mortensen, 6138 W. Poinsettia, Glendale, Ariz. 85304
Filed Oct. 17, 1989, Ser. No. 422,747
Int. Cl.[5] A63B *69/36*
U.S. Cl. 273—189 R **5 Claims**

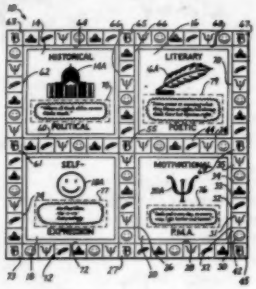
1. Golf swing training apparatus for a golfer having a torso and an upper arm, comprising, in combination:
band means securable to the golfer's upper arm; and
elastic means secured to the band means and adapted to be disposed about the golfer's torso for urging the golfer's upper arm against the torso as the golfer swings said elastic means having a generally circular cross sectional configuration to allow the elastic means to roll over the golfer's torso during the golfer's swing.

4,940,238
GOLF PUTTING PRACTICE BALL AND SYSTEM
Robert J. Bradley, 216 Mardale Dr., Somerdale, N.J. 08083
Filed Jan. 25, 1988, Ser. No. 147,456
Int. Cl.[5] A63B *69/36, 37/14*
U.S. Cl. 273—199 R **4 Claims**



1. A golf putting practice ball comprising:
a spherical ball having an array of dimples thereon, a weight not greater than 1.62 ounces, and a diameter in the range of 2" to 3".

4,940,239
EDUCATIONAL BOARD GAME APPARATUS AND METHOD OF USING SAME
John O. Tuttle, P.O. Box 941547, Schaumburg, Ill. 60194
Filed Nov. 16, 1988, Ser. No. 272,111
Int. Cl.[5] A63F *3/00*
U.S. Cl. 273—243 **12 Claims**



1. A game apparatus comprising:
a group of decks of playing cards having indicia means thereon configured in the shape of groups of characters forming questions and answers for game playing purposes according to game rules, said decks of cards each containing indicia means defining separate categories of question and answers;
a compact sized game board having a playing area;
said playing area having a plurality of playing card supporting areas for receiving said decks of cards for game playing purposes according to the game rules;
said playing area having path indicia means thereon, said path indicia means being configured in the shape of a plurality of path segments extending along the periphery of said playing card supporting areas and being interconnected in an endless path of travel;
said path segments being subdivided into a plurality of subdivisions;
a plurality of movable position marking player pieces distinguishable from one another and movable from one to another of said subdivisions along said path segments, said pieces being associated individually with the players of the game and being moved by their associated players;

move determining means presenting numerical values determining the move of the player pieces along said path segments;

indicia on the smaller areas of said game board indicative of where a portion of said playing cards are to be placed on the game board according to the game rules;

category indicia means on individual ones of the subdivisions of said game board for designating according to the game rules corresponding ones of the decks of playing cards;

means defining a plurality of common bi-directional starting positions, said means defining a plurality of common bi-directional starting positions being spaced in a random manner on selected individual ones of the subdivisions of said game board for designating player piece starting positions that can be occupied by any one of the player pieces according to the game rules;

means defining individual bi-directional subdivisions which can be occupied by any player piece and that can be approached from any direction according to the game rules;

said path segments including four inner segments and eight outer segments, each inner segment extending along a portion of the periphery of two of said playing card supporting areas to help define them, each outer segment extending along a portion of the periphery of one of said playing card supporting areas to help define it;

interconnecting means defining a common subdivision joining the ends of said inner segments for extending and for forming a portion of said endless path of travel therebetween;

said interconnecting means for permitting bi-directional movement of each of said player pieces between pairs of said inner segments, according to the game rules;

means defining four common subdivisions each connected between pairs of outer segments and the opposite ends of one of said four inner segments to extend and to form a portion of said endless path of travel; and

said means of defining four common subdivisions for permitting bi-directional movement of each of said player pieces between pairs of outer segments and between an inner segment and the pairs of outer segments according to the game rules.

4,940,240

GAME TO PROMOTE ARITHMETIC SKILLS

Joseph M. Braley, P.O. Box 488, Moab, Utah 84532

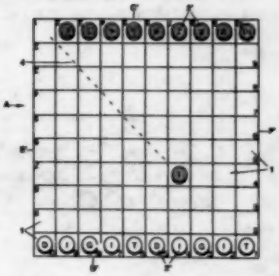
Filed May 11, 1989, Ser. No. 350,454
Int. Cl.[5] A63F *3/02, 3/00*
U.S. Cl. 273—260 **27 Claims**

1. A method of play of a game of chance and strategy played by at least two players, wherein said method comprises:

providing a playing board comprising a plurality of distinct positions in a pattern of rows crossed in at least two different directions, each distinct position being defined by the intersection of at least two rows oriented in different directions;

providing a plurality of playing pieces for each player to be moved from one position to another on said board, providing for the possession of a player for each turn of play at least one number,

the movement of a respective piece during at least most of the turns of play being possible over different paths and being dependent on and selected after applying a mathematical operation using at least two numbers in the possession of the player.

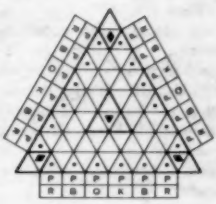


4,940,241

THREE PLAYER CHESS-TYPE GAME

John A. Faraci, Jr., 2615 Shenandoah Ave., Durham, N.C. 27704

Filed Sep. 27, 1989, Ser. No. 413,338
Int. Cl.[5] A63F *3/02*
U.S. Cl. 273—261 **14 Claims**



1. A three player chess game, comprising:

(a) a game board including:

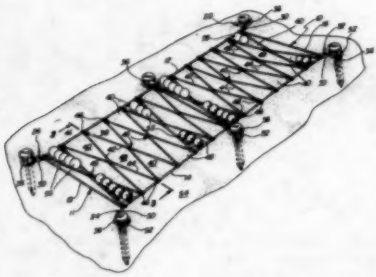
(i) an equilateral triangle-shaped playing surface with an array of equilateral triangle-shaped playing spaces demarcated thereon, wherein there is an equilateral triangle-shaped apex playing space located at each of the three apices of the equilateral triangle-shaped playing surface, each of said apex playing spaces having one side located within the interior of the equilateral triangle-shaped playing surface and two sides along the edge of the equilateral triangle-shaped playing surface; and

(ii) a rectangular home area playing surface at each side of the equilateral triangle-shaped playing surface, each of said home areas extending from one end of an interior side of an apex playing space to one end of an interior side of another apex playing space, to define respective

home areas for the players' game pieces so that each of the three players has a separate home area at a specific side of the equilateral triangle-shaped playing surface, each of said home area playing surfaces having an array of spaces demarcated thereon defining home spaces for a specific player's game pieces; and

(b) a set of game pieces for each of the three players each of the sets of game pieces being differentiable from the other sets so that all game pieces of a given set are identifiable as belonging to a specific player.

4,940,242
GAME APPARATUS
Todd J. Tingley, 425 Avenue G., Redondo Beach, Calif. 90277
Filed May 22, 1989, Ser. No. 354,736
Int. Cl.[5] A63F *3/02, 3/00*
U.S. Cl. 273—287 **7 Claims**



1. A game apparatus to be secured in a playing mode on a ground surface comprising:

a flexible playing area having a substantially rectangular configuration defined by an elongated peripheral cord member;

a plurality of cord section members that are interwoven to form and define a plurality of juxtaposed play sections within said playing area;

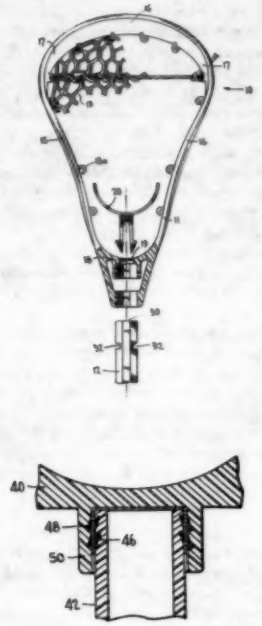
hold-down means selectively positioned about said peripheral cord member;

wherein said cord section members are formed in pairs to define contiguous, triangularly shaped, play sections, whereby each paired cord section member is looped about the other to define a pair of oppositely disposed, triangular shaped play sections; and

means for securing said cord section members to said peripheral cord member.

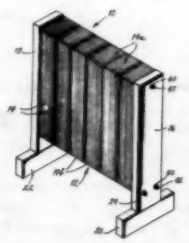
4,940,243
LACROSSE STICK
Richard B. C. Tucker, Baltimore; Jackie L. Davis, Aberdeen, and Fielding H. Lewis, Jr., Queenstown, all of Md., assignors to Wm. T. Burnett & Co., Inc., Baltimore, Md.
Filed Sep. 29, 1989, Ser. No. 414,258
Int. Cl.[5] A63B *59/02*
U.S. Cl. 273—326 **16 Claims**

1. A lacrosse stick comprising a head having a generally V-shaped frame defined by two side walls, a transverse stop extending between said side walls and cooperating with a throat portion, a transverse wall joining the ends of said side walls opposite the transverse stop, and a retainer means having one or more prongs extending longitudinally from said head for attaching said head to a handle and a handle having one or more slots for receiving said prongs, whereby said prongs



connectively engage said slots to attach said head to said handle.

4,940,244
ARCHERY TARGET
John W. Batts, III, Lincoln, Mo., assignor to Christine R. Batts, Foley, Mo., a part interest
Filed Sep. 20, 1989, Ser. No. 410,149
Int. Cl.[5] F41J *3/00*
U.S. Cl. 273—403 **12 Claims**



1. An archery target comprising a target body having an assembly of discrete, elongated modules, first and second opposed, upright supports having upper and lower ends for forming the sides of said target and framing said target body therebetween, base members for mounting said upright supports in a vertical position relative to the ground or other surface, and target body attachment means for connecting said target body

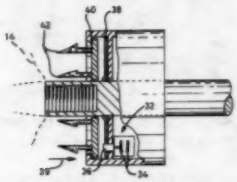
to said upright supports; each of said elongated modules comprising a plurality of mutually adhered, discrete, sheet-like elements; said target body attachment means for connecting said target body assembly modules to each of said upright supports and comprising therefore first adaptor means, for rigid securement to said first upright support, and second adaptor means for adjustable securement to said second upright support.

4,940,245

ARROW/WOUNDED ANIMAL TRACKING DEVICE

Harley E. Bittle, Jr., 1737 Campbell Station Rd., Knoxville, Tenn. 37932

Filed Oct. 4, 1988, Ser. No. 253,044
Int. Cl.[5] H04B *1/034*
U.S. Cl. 273—416 **6 Claims**



2. An arrow/wounded-animal tracking device for mounting on the shaft of an arrow for use in conjunction with a receiver having directional finding capability, said device comprising:

a housing defining an opening therethrough for receiving said shaft of said arrow;

means for releasably securing said housing on said shaft of said arrow said means comprising a membrane mounted in said opening of said housing for circumscribing, and friction-fit engagement of, said shaft of said arrow; and

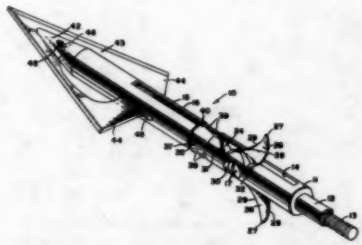
signal generating means housed within said housing for generating a signal for being received by said receiver to facilitate the tracking of said arrow/wounded animal.

4,940,246

ARROW ATTACHMENT

Jonathan B. Stagg, 4213 E. 28 Rd., Cadillac, Mich. 49601

Filed Aug. 14, 1989, Ser. No. 393,882
Int. Cl.[5] F42B *6/08*
U.S. Cl. 273—421 **7 Claims**



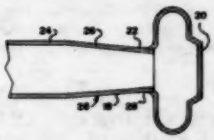
1. An arrow attachment comprising a body having an elongate slot extending therethrough; a pair of blades accommodated in said slot in side-by-side relation; each of said blades having a cutting edge; pivot means mounting said blades on said body for rocking movements about an axis between a retracted position within said slot and a projected position in which each of said blades extends laterally outwardly of said slot and on opposite sides of said body; and actuating means carried by each of said blades and extending outwardly of said slot when its associated blade is in said retracted position, each of said actuating means being so located relative to its associated blade as to be operable to rock its associated blade from said retracted position toward said projected position in response to the application of force on such actuating means in one direction, the extent of the rocking movement being such that each of said actuating means may move from a projected position at one side of said body through said slot to a projected position at the opposite side of said body.

4,940,247

BAT WITH REVERSE CONICAL GRIP

John A. Magadini, Phoenixville, Pa., assignor to Ten Pro Corporation, Phoenixville, Pa.

Filed Mar. 22, 1989, Ser. No. 327,319
Int. Cl.[5] A63B *59/06*
U.S. Cl. 273—72 A **6 Claims**



1. A hollow metallic baseball bat comprising:

a bat body having a generally cylindrical, upper, impact portion of a first, large diameter, a generally cylindrical, lower, handle portion of a second, smaller diameter and a transition zone intermediate the impact portion and the handle portion,

the impact portion terminating upwardly in a closed end and the handle portion terminating downwardly in an enlarged knob, the knob having a diameter greater than the diameter of the handle portion; and

the handle portion being subdivided into an upper area adjacent to the transition zone, the upper area having uniform diameter and a lower area adjacent to the knob, the lower area having non-uniform diameter, the lower area of non-uniform diameter having an upper, large diameter section and a lower, small diameter section, the lower, small diameter section terminating downwardly at the said knob and the upper, large diameter section of the lower area terminating upwardly at the said handle portion uniform diameter upper area.

4,940,248

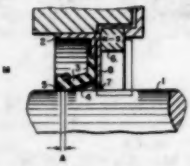
SEAL FOR A MAGNETIZABLE SHAFT

Gerhard Kilthau, Mannheim; Karl H. Spies, Birkenau; Rolf Vogt, Oftersheim; Peter Freilaender, Mannheim, and Toni Seethaler, Gorxheimertal, all of Fed. Rep. of Germany, assignors to Firma Carl Freudenberg, Weinheim an der Bergstrasse, Fed. Rep. of Germany

Filed Jan. 30, 1989, Ser. No. 303,821
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807893
Int. Cl.[5] F16S *15/56*
U.S. Cl. 277—80 **8 Claims**

1. In a shaft seal comprising (a) a magnetizable shaft having a central, longitudinal axis; (b) a seal housing, surrounding the shaft, having a radially displacable sealing lip of polymeric material, said sealing lip comprising a sealing surface engaged with the shaft and two conical end surfaces on opposite sides of said sealing surface, said conical end surface on the side facing away from a space to be sealed having a smaller angle with respect to said axis than the axially opposite conical end surface to effect a pumping action toward the space to be sealed,

and (c) a preliminary seal on the side facing away from the space to be sealed; the improvement wherein the preliminary seal comprises a ring magnet means having a pole member defining a pole surface which surrounds the shaft with a gap therebetween, and wherein a ferrofluid is disposed in said gap thereby forming a ferrofluidic seal, the ferrofluid being lifted



away from the surface of the shaft when the pumping action exceeds the ability of the ferrofluidic seal for a moment so that air of atmospheric pressure can flow into the space between the ferrofluidic seal and the sealing lip, thus compensating for the partial vacuum therein, before the ferrofluid again makes contact with the entire circumference of the shaft.

4,940,249

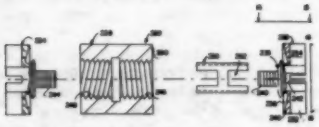
CLAMP DEVICE WITH RADIALLY SPLIT HEAD

Vladimir J. Drbal, 400 Davey Glen Rd., Belmont, Calif. 94002

Continuation-in-part of Ser. No. 116,021, Nov. 3, 1987, Pat. No. 4,804,197. This application Feb. 13, 1989, Ser. No. 310,356

Int. Cl.[5] B23B *31/20*

U.S. Cl. 279—41 R **3 Claims**



1. A device for clamping a pair of workpieces together comprising:

a pair of fastener heads, each defining an axially extending passageway, and each composed of an exterior portion having an exterior surface and defining slots extending axially from said surface, said slots forming segments in said head about said passageway, and an interior portion defining an interior surface having a camming surface such that movement of the head in an axial direction against a contact surface forces the segments in the head radially inwardly, thereby reducing the cross-section of the passageway, adjacent the exterior surface of the head, and

means mounting the two heads for axial movement toward and a way from a contact position at which the camming surface of the two heads are simultaneously brought into contact with an associated contact surface, with further movement of the two heads axially toward one another acting to force the segments in each head radially inwardly, substantially the same extent, thereby reducing the cross-section of the passageway associated with each head, and causing clamping of a workpiece received in the passageway defined by each head,

said mounting means including a shaft on which the two heads are carried, for relative movement toward or from one another, with relative rotation of the heads on the shaft, to a contact position in which the camming surface of one head is in contact with the camming surface of the other head, such that the camming surface of each head serves as the associated contact surface for the other head, where said shaft is rigidly attached to one head, and the other head is rotatably mounted on the shaft for axial movement thereon, with rotation of said other head.

4,940,250

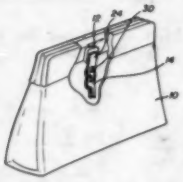
MAGNETIC KEY HOLDER

Josephine Corrado, 16951 Heather La., Mt. Clemens, Mich. 48044

Filed Jul. 14, 1989, Ser. No. 380,104

Int. Cl.[5] A45G *11/32*

U.S. Cl. 206—37.1 **20 Claims**



1. A key holding article comprising:

A rigid body portion including means for detachably attaching said body portion to the interior of a portable apparel enclosure;

at least one key holding portion, said at least one key holding portion being magnetically attachable to said body portion;

said rigid body portion including a back interior attaching side, a front key holding face provided opposite said back side, a top key holding face provided adjacent said front face and said back side, a bottom key holding face disposed opposite said top face, a first side key holding face provided adjacent said back side and front, top and bottom faces, and a second side key holding face disposed opposite said first side key holding face;

said at least one key holding portion being detachably attachable to one or more of said faces.

4,940,251

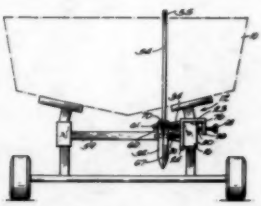
MARKER ASSEMBLY FOR A BOAT TRAILER

Vernon H. Willmsen, 2413 S. 95 St., West Allis, Wis. 53227

Filed May 6, 1988, Ser. No. 191,037

Int. Cl.[5] B60P *3/10*

U.S. Cl. 280—414.1 **6 Claims**



1. A boat trailer marker assembly, comprising:

a position indicator including an elongated pole and hollow reservoir secured to said pole proximate an end thereof, said reservoir having an internal chamber;

a support bracket having means for releasably securing said bracket to a boat trailer;

an axle fixedly secured to said bracket;

mounting means for pivotally securing said marker to said axle of said marker, said mounting means positioned to cause said pole to pivot downwardly when said reservoir is empty and said marker is in a non-submerged state, and to cause said pole to pivot upwardly once the reservoir is

filled with water and said reservoir is in a non-submerged state;

discharge means for allowing water within such chamber to drain therefrom when said marker pivots on said axle to a horizontal position and said reservoir is in a non-submerged state; and

inlet means for allowing water to enter and fill said chamber when said reservoir is submerged in water.

4,940,252

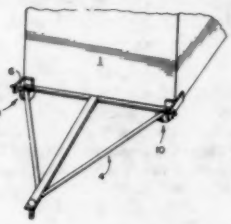
REMOVABLE CONTAINER CASTER ASSEMBLY WITH TOW CAPABILITY

Bill G. Seib, Friendswood, Tex., assignor to Grumman Aerospace Corporation, Bethpage, N.Y.

Filed Apr. 13, 1989, Ser. No. 340,117

Int. Cl.[5] B62D *53/06*

U.S. Cl. 280—418.1 **4 Claims**



3. A transportable ISO type container comprising:

a housing having four lower corner brackets;

four simply removable caster assemblies each connected to a respective bracket and comprising:

a baseplate and two orthogonal plates standing upwardly relative to the baseplate for receiving a corner bracket of a container;

a block fixed at its lower end to the baseplate and extending in spaced parallel relation to the orthogonal plates for engaging a corner of a container;

caster means fastened to the baseplate and extending downwardly for allowing the assembly to be rolled;

a tow bar removably attached to two adjacent assemblies for towing the container;

an L pin for removably fastening the assembly to a container corner including

(a) a first section passing through a through-bore formed in one of the orthogonal plates for receipt within a blind bore formed in a confronting surface of the block; and

(b) a second section rotatable for engagement by a slot formed in the baseplate thereby selectively securing the L pin in place.

4,940,253

SAFETY BINDING

Jean-Claude Brischoux, Seynod, France, assignor to Salomon S.A., Annecy cedex, France

Filed Feb. 17, 1988, Ser. No. 156,821

Claims priority, application France, Feb. 18, 1987, 8702596

Int. Cl.[5] A63C *9/085*

U.S. Cl. 280—629 **50 Claims**

1. A safety binding for a ski boot comprising:

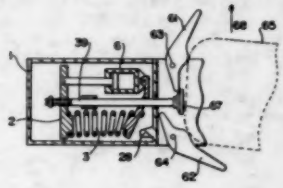
(a) a jaw for retaining a portion of said boot, and to release said portion of said boot under the effects of a force greater than an elastic return force, said jaw being movable between a stable equilibrium position and a release position in which said jaw releases said boot;

(b) an energization assembly comprising:

(i) elastic return means for exerting said elastic return force on said jaw to bias said jaw to said stable equilibrium position;

(ii) shock absorption means for absorbing shock; and

(iii) means for varying said elastic return force as a function of intensity and duration of said force on said boot, whereby under an effect of a soft force said elastic return means and said shock absorption means act in



parallel to define said elastic return force and return conditions of said jaw, while under an effect of a brief high force said elastic return means exerts an elastic return force on said jaw which has a magnitude greater than that due to said soft force, said means for varying said elastic return force comprising a compensation device operably associating said elastic return means and said shock absorption means.

4,940,254

SEAT BELT HOLDER POSITION ADJUSTER

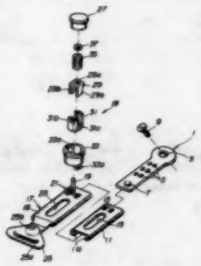
Shuichi Ueno, Ebina, Japan, assignor to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Apr. 25, 1988, Ser. No. 185,408

Claims priority, application Japan, May 28, 1987, 62-129867; May 29, 1987, 62-133959

Int. Cl.[5] B60R *22/20*

U.S. Cl. 280—808 **61 Claims**



1. A seat belt holder position adjuster comprising:

a base unit including an elongate base member having two adjacent rows of latch holes formed therethrough;

an anchor unit disposed on said base unit in a manner to slide therealong;

a belt holding member connected to said anchor unit to move therewith; and

a latch pawl unit mounted on said anchor unit, said latch pawl unit including a generally U-shaped monolithic latch piece having two shank portions which are sized and arranged to be latchingly engageable with an adjacent pair of latch holes, said pair comprising a latch hole from each of said two adjacent rows of the base unit, and a biasing means for biasing said latch piece in a direction to achieve latching between said shank portions and said paired latch holes,

wherein said anchor unit includes guide holes through

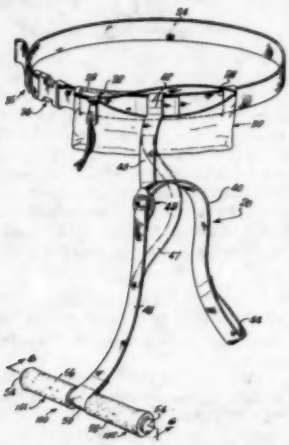
which said shank portions of said latch pawl unit are passed to be exposed to said elongate base member, an anchor member, and a guide member tightly held by said anchor member, said guide member having at its sides mutually facing guide grooves by which said base member is slidably guided.

4,940,255

METHOD AND APPARATUS FOR SUPPORTING SKIS ON A SKI LIFT

Michael T. Donine, P.O. Box 6836, Oxnard, Calif. 93030

Filed Feb. 16, 1989, Ser. No. 313,167
Int. Cl.[5] A63C *11/22*
U.S. Cl. 280—809 **6 Claims**



1. Apparatus suitable to be worn upon the body of a skier, said apparatus being for the purpose of providing a support for skis while a skier is riding upon a ski lift chair comprising in cooperative relationship: adjustable belt means suitable to encompass the waist of a skier; first pouch means carried by said adjustable belt means and having an openable closure; first connecting means fastened to said belt means in such manner as to be insertable in said pouch means; second connecting means adjustably connected to said first connecting means in such manner as to be insertable with said first connecting means in said pouch; support means for two skis removably fastened to said second connecting means and in such manner as to be insertable into said pouch with said first and second connecting means.

4,940,256

TANK TRUCK-STORAGE VESSEL

John W. Jordan, III, Rte. 1, Box 326A, Fairview Rd., Fountain Inn, S.C. 29644

Continuation of Ser. No. 200,032, May 27, 1988. This application Dec. 8, 1989, Ser. No. 447,718
Int. Cl.[5] B60P *3/22*
U.S. Cl. 280—837 **16 Claims**

1. Apparatus for transporting and storing liquids such as chemicals and the like, comprising:

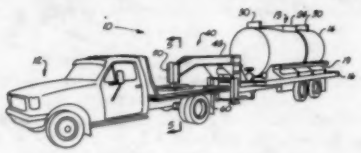
(a) a tank for containing a liquid disposed upon a longitudinal frame, having an opening for filling said tank with liquid;

(b) wheeled means for supporting one end of said longitudinal frame;

(c) an extended connector means attached to an end of said frame opposite said wheels and, including a fifth wheel extending from the end of said connector means adapted for connection to a prime mover;

(d) extendable support means secured to said frame adjacent said connector means for supporting said end of said longitudinal frame when said connector means is detached from said prime mover for free standing storage;

(e) self-contained pumping means in association with said tank for pumping said liquid from said tank; and



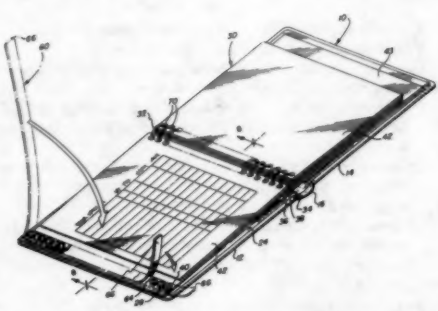
(f) a platform defined by said longitudinal frame surrounding said tank providing protection for said tank during transit and further providing an area for standing while working on said tank during free standing storage.

4,940,257

ONE-WRITE BOOK ASSEMBLY WITH REMOVABLE INSERT

Daniel A. Hincks, Burlington; William T. Hincks, Madison, and Robert W. Hincks, Farmington, all of Conn., assignors to Data Management, Inc., Farmington, Conn.

Filed Oct. 3, 1989, Ser. No. 416,534
Int. Cl.[5] B41L *3/00*
U.S. Cl. 282—29 B **11 Claims**



1. A one-write bookkeeping assembly comprising:

(a) a foldable posting book cover having a pair of panels hinged along an intermediate fold, one of said panels having a multiplicity of locating elements spaced along the outer end thereof, said one panel also having a pocket formed on its inner surface and opening towards said fold; and

(b) a removable insert member seated in said posting book cover and having a multiplicity of spaced rings disposed in alignment with said fold of said cover, said insert member having a multiplicity of record keeping sheets perforated along one edge and slidably seated on said rings for pivotal movement between positions overlying each of said panels, said insert member additionally having mounting panel means secured on said rings to releasably retain said insert in said book cover, said panel means including a first panel extending into said pocket, said panel means also including a second panel extending over said one panel with apertures adjacent its outer end through which said locating elements extend, at least one of said record keeping sheets being pivoted into a position overlying said second panel; and

(c) a set of shingled forms having perforations in a portion adjacent one side through which said mounting elements

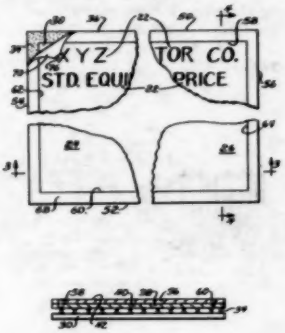
extend, said shingled forms overlying said one of said record keeping sheets, at least one of adjacent surfaces of said forms and said one sheet having means thereon for recording selected data on said recording keeping sheet when said data are being entered on said forms.

4,940,258

DISPLAY STICKER FOR A VEHICULAR WINDOW

Ronald R. Cuba, Jr., Wichita, Kans., and Roland Jenkins, Holly, Mich., assignors to Uarco Incorporated, Barrington, Ill.

Filed Jan. 6, 1989, Ser. No. 293,978
Int. Cl.[5] B42D *15/00*
U.S. Cl. 283—81 **7 Claims**



1. A business form for use as a removable sticker wherein a variable information receiving section may be adhered to a transparent object and then easily removed therefrom without carrying residual adhesive, said business form comprising:

a first sheet of label stock having one side coated with pressure sensitive adhesive;

a second sheet of release liner material having a size and shape corresponding to said first sheet, a coated surface removable adhered to said adhesive, and an opposed surface remote from said adhesive for receiving variable information to be displayed through a transparent object;

cuts in said second sheet near at least two opposed edges thereof so that parts of said second sheet between said opposed edges and said cuts may be removed from adhesion to said first sheet to expose adhesive at said two opposed edges in flanking relation to said opposed surface and variable information thereon, whereby said form may be adhered to a transparent object by said exposed adhesive and, when removed therefrom, the remainder of said second sheet may be peeled from said first sheet free of residual adhesive;

said cuts being opposed parts of a peripheral cut in said second sheets, said peripheral cut in the edges of said second sheet defining a removable, one-piece continuous peripheral frame; and,

an exposed grasping tab on one of said sheets;

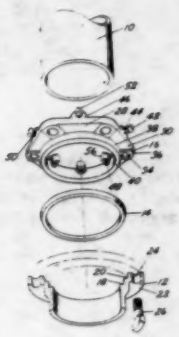
there being a plurality of said business forms in end-to-end abutment delineated from one another by lines of weakening to thereby define a continuous business form.

4,940,259

SWIVEL LUG PIPE JOINT CONNECTIONS

James H. Williams, Columbus, Ga., assignor to Standard International, Inc., Columbus, Ga.

Filed Mar. 13, 1989, Ser. No. 322,520
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—3 **20 Claims**



1. A pipe joint connection for forming a coupling between a pipe section and an attachment, comprising:

(a) a web adapted to surround the pipe section in a plane substantially perpendicular to the pipe section axis, for being connected to the attachment to form the coupling;

(b) a plurality of threaded set screw openings oriented toward the pipe section formed circumferentially substantially equidistant from each other on the web; and

(c) a plurality of set screws, each disposed in a set screw opening, and each comprising:

(i) a threaded shank whose threads cooperate with the threads in the set screws openings;

(ii) a head connected to the shank for receiving a torquing means;

(iii) a substantially convex, curved shaped swivel surface connected to the shank; and

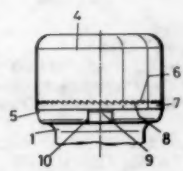
(iv) a swivel foot having a cavity to receive the swivel surface to allow the foot to swivel on the swivel surface and a grip face to allow the set screw to grip the pipe section.

4,940,260

FLUID CONDUIT COUPLING DEVICE

José I. Uriarte Odriozola, Vitoria, Spain, assignor to Terrain SDP, S.A., Vitoria, Spain

Filed Jul. 19, 1989, Ser. No. 381,956
Claims priority, application Spain, Jan. 23, 1989, 8900166
Int. Cl.[5] F16L *35/00*
U.S. Cl. 285—3 **4 Claims**



1. Fluid conduit coupling device including a conduit head provided with a coupling thread for a threaded sleeve by means of which a conduit is tightly secured to said head, said

sleeve having an end adjacent said head, said end provided with a straight-profiled dentation, and between the said sleeve and the head there is provided a complementary ring provided, in turn, with another dentation, complementary to that of the sleeve, said ring having an axis said dentations being oriented so as to permit the sleeve to turn in a tightening direction when threaded on said conduit head and to prevent the sleeve from turning in the opposite direction, and means for fixing said complementary ring to the head against rotation in either direction.

4,940,261

PIPE COUPLINGS

John R. Somers Vine, Transvaal, South Africa, assignor to Dorbyl Light and General Engineering (Proprietary) Limited

Filed May 13, 1988, Ser. No. 193,904

Claims priority, application South Africa, May 14, 1987, 87/3470

Int. Cl.[5] F16L *17/04*

U.S. Cl. 285—112 **5 Claims**

1. A pipe coupling for forming a pipe joint between adjacent ends of two pipes located in co-axial end-to-end relationship, the coupling comprising a pair of discrete, substantially identical half shells each including, on one end thereof, means mechanically to secure the half shells to one another to form a coupling sleeve for complementally shaped pipe ends and each half shell including, on the other end thereof, an L-shaped hook formation which is interengageable with the hook formation of the other half shell to complete the connection of the half shells to one another, each L-shaped hook formation comprising a leg which projects radially from the outer surface of the half shell and a base which is integral with the leg of the hook formation and which extends axially, relatively to the cylindrical axis of the half shell and inwardly beyond the transverse center line of the pipe coupling, the hook formations being adapted, upon engagement of the hook formations with one another, for the legs of the L-shaped hook formations to abut one another and the base of each L-shaped formation to engage the other hook formation by hooking over the leg part thereof and abutting, in opposed relationship, the base part thereof.

4,940,262

CABLE STRAIN RELIEF

Frederick A. Baracat, Coral Springs, and Stanley A. Yaeger, Jr., Plantation, both of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Jun. 5, 1989, Ser. No. 361,084

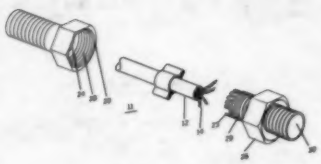
Int. Cl.[5] F16L *35/00*

U.S. Cl. 285—114 **4 Claims**

1. A cable strain relief device, comprising:

a cable having a band attached thereto the band being crimped to provide at least one radial crimp rib and crimped to clamp the band to the cable; and

a receptacle comprising a plurality of fingers having at least one slot formed between the fingers therein to engage said



at least one radial crimp rib and means to retain said at least one radial crimp rib in said at least one slot.

4,940,263

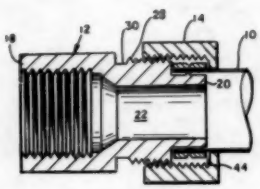
FITTING FOR TUBING

Andrew B. Mayernik, McKeesport, Pa., assignor to Dormont Manufacturing Company, Pittsburgh, Pa.

Filed Oct. 11, 1988, Ser. No. 255,491

Int. Cl.[5] F16L *19/04*

U.S. Cl. 285—342 **10 Claims**



1. A fitting for connecting to an end of a thin walled tube comprising a body, a nut and a ferrule,

said body having a generally cylindrical flow passage therethrough, a first end, a reduced size cylindrical second end and an intermediate part,

said flow passage having internal threads at said first end,

said internal threads having a central axis,

said intermediate part of said body having external threads,

said reduced size cylindrical second of said body having an external cylindrical surface,

an outwardly extending shoulder having an annular surface generally planar throughout its extent extending outwardly from and intersecting said cylindrical surface of said reduced size cylindrical second end,

said ferrule comprising a hollow cylindrical ring made of a deformable material having an outside cylindrical surface, an inside cylindrical surface, a first end and a second end,

said internal cylindrical surface of said ferrule being adapted to receive an end of said tube,

said nut having hollow internal threads terminating at an inwardly directed annular flange having an annular surface generally planar throughout its extent disposed at right angles to said central axis of said internal threads,

both said angular surface on said intermediate part and said annular surface on said flange being disposed generally perpendicular to said reduced size second end,

said tube abutting said shoulder which joins said intermediate part and said cylindrical surface,

said nut being adapted to receive said ferrule and to threadably engage said external threads of said intermediate part of said body, whereby said ferrule creates a seal when it is sandwiched between said annular shoulder of said flange, and said outwardly extending shoulder extending out-

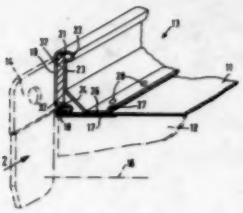
wardly from said cylindrical surface of said reduced size cylindrical second end, between said internal threads of said nut and the outside surface of said tube end when said nut is tightened onto said body.

4,940,264

FLANGE CONNECTION

Georg Mez, Silberdistelweg 68, 7410 Reutlingen-Gonningen, Fed. Rep. of Germany

Filed Apr. 12, 1984, Ser. No. 599,501
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1983, 3313235
Int. Cl.[5] F16L *23/00*
U.S. Cl. 285—405 12 Claims



1. In a flange connection for rectangular air conditioning ducts having four walls about a geometric longitudinal axis, said flange connection having:

(a) four substantially L-shaped hollow flange profiles made from sheet metal

(b) viewed in the longitudinal direction of the profile, said flange profiles having substantially: a first longitudinal arm arranged to be parallel with the geometric longitudinal axis of the air conditioning duct and to bear when the flange connection is assembled on the inside face of the duct wall,

a first radial arm at right-angles to the geometrical longitudinal axis of the air conditioning duct, emanating from said first longitudinal arm for location in front of the end face of the duct wall,

an outer arm emanating from said first radial arm and arranged to extend back to behind the end face of the duct wall when the flange connection is assembled,

a second radial arm emanating from said outer arm and extending at a distance from and parallel with said first radial arm,

an oblique arm extending from said second radial arm at approximately half the height of said first radial arm, and

a second longitudinal arm emerging from said oblique arm and arranged, when the flange connection is assembled, to bear on the outside face of the duct wall, opposite said first longitudinal arm,

(c) a bead extending into said hollow profile, shaped into said first radial arm, said bead being formed with a first bent portion starting from said first radial arm and a first web extending from said first bent portion approximately at a right angle to said first radial arm and situated opposite and at a distance from said outer arm,

(d) said radial arms, said outer arm, and said firt web, being arranged to receive angle pieces with a close fit,

(e) said bead being formed with a second web disposed between said first web and said first longitudinal arm, a second bent portion merging said second web at one end into said firt longitudinal arm, a first substantially semi-circular arc connecting said second web at the other end to said first web,

(f) said second bent portion being constructed as a second substantially semi-circular arc which merges directly into said first longitudinal arm from said second web, and

(g) said bead being so formed that said first arc is spaced at a distance from said first longitudinal arm which is less than the distance between opposing faces of said first and second longitudinal arms as determined by a predetermined thickness for the duct wall, whereby said bead can bear with a clamping fit on the outside face of the duct wall.

4,940,265

WIREGATE CLOSER

Albinus A. Weigel, 1412 E. 8th St., Hays, Kans. 67601

Filed Oct. 23, 1989, Ser. No. 424,988
Int. Cl.[5] E05C *19/14*
U.S. Cl. 292—113 11 Claims

1. A wiregate closer comprising:

(a) a pivot bar;

(b) a separate handle having two ends, said handle being fixed at one of said ends to said pivot bar, said handle and said pivot bar lying in the same plane and said handle being disposed at an upward angle of from about 5 degrees to about 15 degrees relative to said pivot bar, whereby said handle is above said pivot bar; and

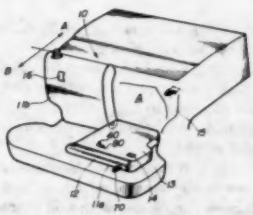
(c) a strap pivotably attached to said pivot bar near a first end of said strap and terminating in a hook at the other end.

4,940,266

LATCH DEVICE FOR FOLDABLE BACKREST OF AUTOMOTIVE SEAT

Daishiro Sakamoto; Takayuki Mouri, and Hisao Tamura, all of Kanagawa, Japan, assignors to Ikeda Bussan Co., Ltd., Ayase, Japan

Filed Nov. 30, 1988, Ser. No. 277,955
Claims priority, application Japan, Jan. 26, 1988, 63-8693[U]
Int. Cl.[5] E05C *3/26;* B60N *1/10*
U.S. Cl. 292—227 8 Claims



1. In a foldable backrest of an automotive seat, a latch device which comprises:

a striker secured to a fixed member;

a base member secured to said backrest to move therewith;

a latch member pivotally supported by said base member, said latch member being latchingly engageable with said striker when said backrest assumes a given raised position;

biasing means for biasing said latch member in a direction to

achieve a latched engagement between said latch member and said striker;

a latch cancelling mechanism operably connected to said latch member for pivoting said latch member in a direction to release said striker when moved in a given direction;

a one-way function mechanism interposed between said latch cancelling mechanism and said latch member, said one-way function mechanism permitting a latched engagement of said latch member with said striker without moving said latch cancelling mechanism in said given direction; and

a stopper mechanism including a lever moved with said latch cancelling mechanism and a stopper rod which is projectable into a position to interrupt the movement of said lever;

wherein said one-way function mechanism comprises:

a pin secured to said lever to move therewith, said pin having said latch canceling mechanism connected thereto; and

a projection formed on said latch member, said projection having a recess into which said pin is received.

4,940,267

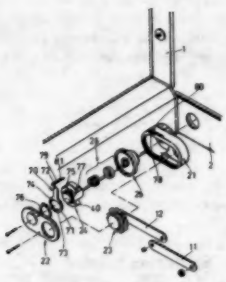
BRACING MEDIUM FOR CASE OR THE LIKE

Jin-Ren Shieh, No. 178, Shih Chia Rd., Taichung City, Taiwan

Filed Sep. 14, 1989, Ser. No. 407,198

Int. Cl.[5] E05C *17/34*

U.S. Cl. 292—263 **8 Claims**



1. A bracing medium for a case having a body and a cover comprising:

an upper arm having a first end pivotally connected to said cover and a second engaging end;

a lower arm having a first end pivotally connected to said second engaging end and a second free end;

a housing held attached to said body;

a follower rotatably mounted in said housing and secured to said second free end;

a lock mounted in said housing and having a tumbler having a keyhole reachable from an outside of said case;

a pawling member engageable with said follower and limitedly rotatably mounted in said housing in a manner that when positioned in a first position, said member can pawl said follower against rotating in a first direction and when positioned in a second position, said member can pawl said follower against rotating in a second opposite direction; and

a clutch mechanism mounted between said tumbler and said pawling member which are mutually engageable to simultaneously rotate by a key to selectively position said pawling member in one of said first and second positions.

4,940,268

TAMPER-PROOF TAG

Dominique Lesquir, 1197 Rang St., Rockland Quebec, Canada, and Bernard Landry, 1256 Fontenay St., St. Foy Quebec, Canada

Filed Nov. 13, 1989, Ser. No. 434,215

Int. Cl.[5] B65D *33/34*

U.S. Cl. 292—317 **6 Claims**

1. A tamper-proof tag consisting of a unitary body formed of molded plastic material and comprising:

(i) a fastener defining a T-shaped body having a stem portion and a head portion; said head portion having, at each opposite end thereof, a depending flexible arm; said stem portion displaying an enlarged extremity having a cross-section greater than that of said stem portion;

(ii) a flexible strap including an elongate portion displaying, from one end thereof and for a major portion thereof, a series of aligned openings, said openings having a cross-section smaller than that of said enlarged extremity of said fastener but slightly greater than that of said stem portion thereof; said strap further including, at an opposite end thereof, a catch for receiving therethrough said one end of said elongate portion and for receiving therein said fastener; said catch defining a slot having a cross-section slightly greater than that of said elongate portion, and an entrance for receiving therein said fastener whereby said stem portion is engaged with said folded elongate portion by forcingly introducing said enlarged extremity through one of said openings; said enlarged extremity being shaped so that, once introduced in said opening, it can not be removed therefrom; and

(iii) flexible means connecting said fastener to said catch.

4,940,269

EXTENSION UNIT FOR DOOR LOCK

Won Se Kim, Seoul, Rep. of Korea, assignor to Hyundae Metal Co., Ltd., Daegu, Rep. of Korea

Filed Oct. 4, 1988, Ser. No. 253,148

Claims priority, application Rep. of Korea, Oct. 5, 1987, 87-17293[U]

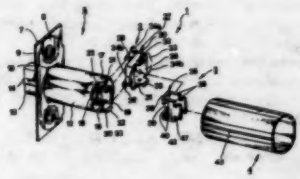
Int. Cl.[5] E05B *9/00*

U.S. Cl. 292—337 **4 Claims**

1. An extension unit for a door lock in combination with a latch unit consisting of a latch tube secured to an auxiliary plate and a face plate, said face plate having two screwholes for attaching said door lock to an edge of a door, a latch bolt and a guard bolt resiliently installed within said latch tube, a back plate affixed to said latch tube and having a central slot and an out-turned ear projected through an upper and a lower opening of an aperture of said latch tube, and a latch bar con-

nected to said latch bolt and passed through said aperture, as well as said central slot, characterized in that there is further included an extension unit comprising;

a single extension element consisting of at least one hook for engaging with said out-turned ear of said back plate, said hook being formed on a surface of a frame, said frame further including a channel, a protrusion and an ear for accepting a cylinder case of a latch bolt actuating unit, said extension element further including front and rear ribs formed on opposite portion of said frame wherein said rear ribs are provided on both sides of said frame;



a connector element consisting of a body which fits within said channel of said extension element frame, the body being provided with two wings, with each wing having a notch at an end portion thereof, a first opening in said connector element, said first opening having a shoulder formed on a front surface of said body for engaging with a notch of said latch bar, and a second opening being interconnected with said first opening thereof, said second opening accepting an end of said latch bar at a side surface thereof; and

a housing element having a longitudinal slit, said housing element covering the entire length of said latch unit.

4,940,270

AUTOMOBILE BUMPER

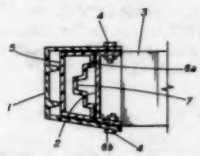
Masayuki Yamazaki; Yutaka Takado, both of Kanagawa, and Takashi Mikami, Tokyo, all of Japan, assignors to Tonen Sekiyukagaku K.K., Tokyo, Japan

Continuation of Ser. No. 159,588, Mar. 28, 1988, abandoned. This application Feb. 27, 1989, Ser. No. 316,038

Claims priority, application Japan, Jun. 27, 1986, 61-152254

Int. Cl.[5] B60R 19/02

U.S. Cl. 293—122 4 Claims



1. An automobile bumper comprising a reinforcement and a surface skin, with a blow-molded hollow body of synthetic resin located between them, said hollow body having at least one longitudinal recess formed by ribs on said hollow body, said ribs having a height of from 50 to 90 percent of the overall height of said hollow body wherein said recess has a depth perpendicular to the longitudinal direction of said recess and said heights are parallel to said depth.

4,940,271

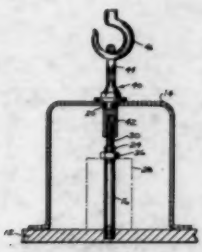
ENGINE LIFTING METHOD AND TOOL

Thomas J. Steffes, Fond du Lac, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Feb. 2, 1989, Ser. No. 308,739

Int. Cl.[5] B66C 1/10

U.S. Cl. 294—1.1 5 Claims



1. A method for lifting an internal combustion engine having a cylinder head, a head cover over said cylinder head, a plurality of studs extending upwardly from said cylinder head in said head cover, and a plurality of head cover bolts mating with respective apertures in the top of said head cover and threadingly engaging respective said studs to mount said head cover to said cylinder head, said method comprising removing at least one of said head cover bolts from its respective said stud and leaving the respective said stud in place in said head cover and attached to said cylinder head, providing a tool having a lower threaded portion and an upper hook portion, replacing said removed head cover bolt with said tool by threading said lower portion of said tool into engagement with said stud such that said upper hook portion of said tool extends above said head cover, engaging said upper hook portion of said tool with lifting apparatus and lifting said engine, removing said tool after said lifting by threadingly disengaging said lower portion of said tool from said stud, and replacing said removed bolt by threading same onto said stud.

4,940,272

SUN VISOR FOR MOTOR VEHICLES

Heinz H. Weick, 94, rue de la Servette, 1202, Genf, Switzerland

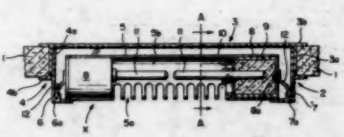
PCT No. PCT/CH88/00024, § 371 Date Oct. 4, 1988, § 102(e) Date Oct. 4, 1988, PCT Pub. No. WO88/05734, PCT Pub. Date Aug. 11, 1988

PCT Filed Feb. 2, 1988, Ser. No. 269,245

Claims priority, application Switzerland, Feb. 5, 1987, 406/87

Int. Cl.[5] B60J 3/00

U.S. Cl. 296—97.5 19 Claims



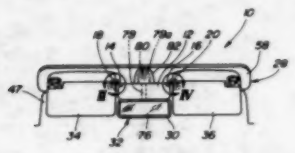
1. Sun visor for motor vehicles, said sun visor comprising a thick-walled visor panel provided with mounting devices for positioning said visor panel in the interior of a vehicle above the windshield so said visor panel can be pivoted from an initial horizontal position into an inclined functional position, said visor panel being provided with a hollow space open on at least one side and means for releasably mounting a device in the hollow space of said visor panel for evaporation of active agents for influencing the interior air in the vehicle.

4,940,273

AUXILIARY VISOR

Masaaki Konishi, Yokohama City, Japan, assignor to Nissan Motor Co., Ltd., Yokohama City, Japan

Filed Mar. 30, 1989, Ser. No. 330,518
Claims priority, application Japan, Mar. 31, 1988, 63-81089
Int. Cl.[5] B60J 3/00
U.S. Cl. 296—97.6 5 Claims



1. An auxiliary visor for a vehicle having a ceiling member, a pair of sun visors supported on the ceiling member and a rearview mirror mounted between the sun visors, said auxiliary visor comprising:

a shield disposed between said sun visors and having an upper end portion;

mounting shaft means rotatably installed on said upper end portion of said shield and having first and second mounting shaft portions projecting outwardly from opposite end portions of said shield; and

first and second mounting brackets installed on said ceiling member and supporting said first and second shaft portions, respectively;

said first mounting shaft portion being formed with a pair of diametrically opposed flat surfaces and said second mounting shaft portion being partially splined;

said first mounting bracket having a sleeve portion receiving said first mounting shaft portion in such a way that said first mounting portion is axially movable but prevented from rotation relative to said first mounting bracket;

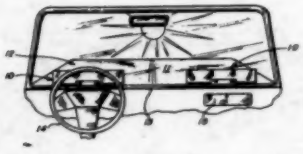
said second mounting bracket having a clip portion splined correspondingly to said second mounting shaft portion and supporting same in such a way that said second mounting shaft portion is prevented from rotation relative to said clip portion and removable from same through movement in the direction substantially perpendicular to its axis.

4,940,274

HOOD GLARE SHIELD

Warren Ogren, Rte. 8, Ogren Rd., Hayward, Wis. 54843

Filed Jan. 25, 1989, Ser. No. 301,070
Int. Cl.[5] B60J 3/00
U.S. Cl. 296—97.7 14 Claims



1. A hood glare shield mountable in the interior of a vehicle such as on the dashboard of a car, comprising

a panel,

a base mountable on the dashboard of such a vehicle,

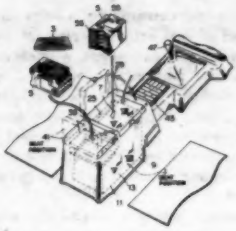
a pair of jaws connected to the base, one of the jaws orienting the panel in an upright and transverse position, another of the jaws resiliently clamping the panel to the orienting jaw, the panel being removably disposed between the orienting jaw and the clamping jaw and transversely slidable therebetween so that the panel is adjustable from side to side as the position of a light source changes relative to the vehicle whereby the hood glare shield blocks glare from the light source reflecting off the hood of the vehicle.

4,940,275

APPARATUS FOR SCANNING RECORDING MEDIA WITH AN AUTOMATIC MEDIUM-CHANGE MECHANISM AND STRUCTURE FOR MOUNTING SAME ON A VEHICLE

Hiroyuki Miki, and Yasushi Kawakami, both of Kanagawa, Japan, assignors to Nissan Motor Company, Limited, Yokohama, Japan

Continuation of Ser. No. 891,322, Jul. 31, 1986, abandoned. This application Sep. 12, 1988, Ser. No. 244,636
Claims priority, application Japan, Aug. 10, 1985, 60-176142; Aug. 12, 1985, 60-175932
Int. Cl.[5] B60R 11/02; G11B 15/68
U.S. Cl. 296—37.8 8 Claims



1. A cassette tape deck mounting structure for the passenger compartment of an automotive vehicle of the type having front seats, a floor mounted shift lever and an inner roof surface, comprising:

(a) a cassette tape deck having an automatic cassette tape change mechanism for continuously playing back a plurality of cassette tapes and having an operation panel, said deck being located at an intermediate position between said front seats and rearwardly of said shift lever, and

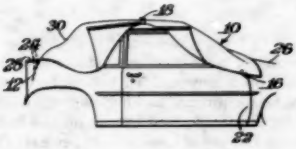
(b) floor console means for housing said cassette tape deck, said console means having a box-shaped housing extending horizontally between said front seats and along a side of each of said front seats, said housing having an upper surface facing toward said roof surface, and said operation panel being accessible from said upper surface.

4,940,276

CAR COVER

Donald Madison, 1275 Weybridge Rd., Columbus, Ohio 43220

Filed Jan. 11, 1989, Ser. No. 299,616
Int. Cl.[5] B60J 11/00
U.S. Cl. 296—136 3 Claims



1. A theft resistance car cover to shield the roof, windshield,

rear window and side windows from the sun, ice and snow comprising:

a cover having a size corresponding to the outer surface of the vehicle roof, windshield, back window and side windows having an outer and inner surface;

a plurality of flexible rear notch lock straps with one end free and the other end attached to the cover at the rear of the cover such that the rear notch straps can be secured in the joint between the trunk lid and the vehicle body;

a plurality of semi-rigid cores located perpendicularly within the rear notch lock straps such that the semi-rigid cores cannot pass through the joint between the trunk lid and the vehicle body;

a plurality of flexible front wedge notch straps with one end free and the other end attached to the cover located at the front corners of the cover such that the front wedge notch straps can be secured in the joint between the door and the vehicle body;

a plurality of semi-rigid wedge shaped cores located perpendicularly within the front wedge lock straps such that the front wedge lock straps can be secured in the joint between the door and the vehicle body and not allow the straps to slip within said joint;

a plurality of slits in the perpendicular direction from the side window edge of the cover located at the vehicle doors so that the doors can be opened;

a means to fasten the slits;

a handle attached to the cove on the top surface of the cover.

4,940,277

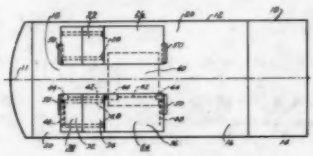
MOTORHOME

V. Donald Buell, 15930 Nisqually Rd.—4B, Victorville, Calif. 92392

Filed May 8, 1989, Ser. No. 348,890

Int. Cl.[5] B60R *1/10*

U.S. Cl. 296—164 **20 Claims**



1. An improved motorhome comprising:

(a) a housing having a longitudinal housing axis and a living compartment, the housing forming a floor for the compartment;

(b) a bed structure having a longitudinal bed axis and a main, horizontally disposed cushion carried thereon;

(c) means for supporting the bed structure in the compartment with the bed axis in a first position parallel to the housing axis;

(d) means for laterally moving the bed structure from the first position to a second position;

(e) a forward cushion;

(f) a rearward cushion;

(g) means for supporting the rearward cushion in a first position horizontally oriented adjacent to the main cushion and aligned therewith along the bed axis;

(h) means for supporting the forward cushion in a first position horizontally oriented adjacent to the rearward cushion and aligned therewith along the bed axis;

(i) means for supporting at least one of the forward cushion and rearward cushion in an inclined position for forming a back-supporting cushion.

4,940,278

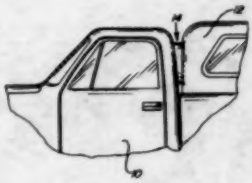
TRUCK CAB-BED UNIT WINDOW SEAL ASSEMBLY

Willard LePere, 1812 N. Waverly, Dearborn, Mich. 48128

Filed Mar. 17, 1989, Ser. No. 324,713

Int. Cl.[5] B60P *3/32*

U.S. Cl. 296—166 **21 Claims**



1. A removable seal assembly interconnecting the rear window opening of a truck cab having an interior with an adjacent front window opening of a bed unit having an interior including a camper or a truck bed cap, said assembly comprising:

a stretchably elastic seal tunnel portion having a resiliently stretchable first end and a resiliently stretchable second end;

a first frame interiorly mounted in said cab;

a second frame interiorly mounted in said bed unit;

means for stretchably and frictionally interconnecting said first end of said tunnel with said first frame; and

means for stretchably and frictionally interconnecting said second end of said tunnel with said second frame;

said first and second ends forming substantially weather tight seals with said first and second frames respectively.

4,940,279

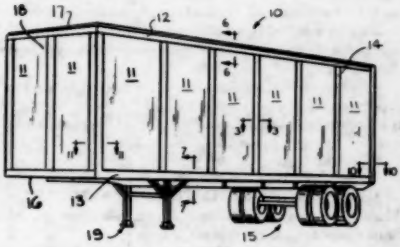
CARGO VEHICLE WALL CONSTRUCTION

Richard A. Abott, Royal Oak; Stephen J. Rings, Farmington, both of Mich., and Michael J. Keeler, Canton, Ohio, assignors to Fruehauf Corporation, Detroit, Mich.

Filed Mar. 16, 1989, Ser. No. 324,486

Int. Cl.[5] B62D *33/04*; E04C *1/00*

U.S. Cl. 296—181 **8 Claims**



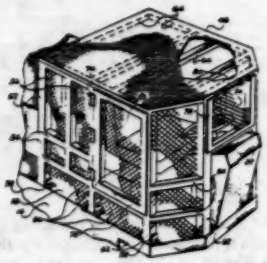
1. In a cargo vehicle having a floor, a roof, a front wall, a pair of sidewalls, and a rear opening wherein at least one of said sidewalls comprises a multiplicity of composite panels wherein each panel includes a planar core of resinous material having a metal skin adhesively bonded to each planar surface thereof, the improvement wherein said resinous core extends to within a predetermined distance from at least one edge of said metal skins, said distance from the end of said resinous core having a rigid material affixed between said skins.

4,940,280

PROTECTION STRUCTURE FOR HEAVY EQUIPMENT

Darrel L. Templeton, Tempe, Ariz., assignor to Hunter Contracting Company, Gilbert, Ariz.

Filed May 2, 1988, Ser. No. 189,468
Int. Cl.[5] B60R *21/11;* B62D *33/06*
U.S. Cl. 296—190 13 Claims



1. An apparatus for protecting the operator's compartment of a piece of heavy equipment of the type including

a floor,

an upstanding support structure raised above said floor, and

a pair of flanges fixedly coupled to said support structure for removably attaching said support structure to a standard protective structure when said equipment is being used above ground,

said apparatus for interchangeably replacing said standard protective structure when said equipment is used in excavations below ground level, said apparatus comprising:

(a) a plurality of sidewalls for surrounding said operator's compartment, said sidewalls including

(i) a first sidewall having

(1) a first vertical support,

(2) a second vertical support,

(3) a third vertical support, and

(4) at least one horizontal support;

(ii) a second sidewall having

(1) a first vertical support,

(2) a second vertical support, and

(3) at least one horizontal support;

(iii) a rear sidewall having

(1) a first vertical support,

(2) a second vertical support, and

(3) at least one horizontal support; and

(iv) a front sidewall;

(b) first and second brackets fixedly coupled to lower ends of said first and second vertical supports of one of said sidewalls for removably attaching said first and second vertical supports to said pair of flanges on said support structure;

(c) an overhead roof section coupled to and supported by the upper edges of said sidewalls; and

(d) a first door pivotally coupled in said first sidewall.

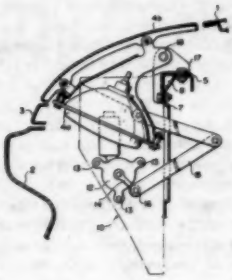
4,940,281

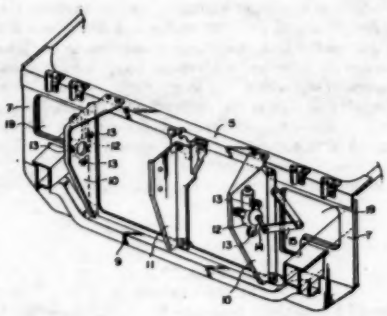
FRONT BODY STRUCTURE OF VEHICLE

Nobuhiro Komatsu, Hiroshima, Japan, assignor to Mazda Motor Corporation, Hiroshima, Japan

Filed Nov. 14, 1988, Ser. No. 270,024
Claims priority, application Japan, Nov. 18, 1987, 62-176103; Nov. 18, 1987, 62-176104
Int. Cl.[5] B60Q *1/05;* B60R *27/00*
U.S. Cl. 296—194 10 Claims

1. A front body structure of a vehicle comprising a pair of retractable head lamp members, a pair of drive means for driving said retractable head lamp members, a radiator shroud upper member disposed on a front side of an engine compartment and extending laterally with respect to a vehicle body, a cross member disposed below said radiator shroud upper member and extending laterally with respect to the vehicle body,





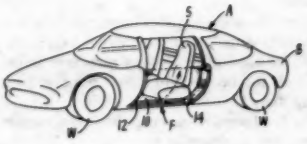
and at least two connecting means for connecting said radiator shroud upper member with said cross member, each of said drive means being mounted on one of said connecting means.

4,940,282

CHASSIS FRAME FOR A WHEELED MOTOR VEHICLE

John A. Townsend, P.O. Box 1518, Pacifica, Calif. 94044

Continuation-in-part of Ser. No. 49,001, May 7, 1987, Pat. No. 4,801,172, which is a continuation of Ser. No. 783,837, Oct. 3, 1985, abandoned. This application Jan. 27, 1989, Ser. No. 303,447
Int. Cl.[5] B60J *5/06;* B62D *23/00*
U.S. Cl. 296—204 16 Claims



1. An improved chassis frame for a wheeled motor vehicle of a given maximum width, said frame comprising:

(a) an elongate floor section of a width substantially less than the maximum width of the vehicle, said section having a central portion comprised of at least one lower longitudinally extending element of a box-like cross-section to impart rigidity to the frame, and said floor section defining longitudinally extending distal edge portions of said frame, said distal edge portions having a depth substan-

tially less than the depth of the longitudinally extending elements of the central portion;

(b) upstanding barrier sections fixed to and extending upwardly from said floor section in longitudinally spaced relationship to one another, said barrier sections defining therebetween door openings on either side of the frame and having outwardly convex curvilinear side portions extending laterally outwardly relative to the floor section; and

(c) a door complemental in shape to each of the curvilinear side portions of the barrier sections and proportioned for receipt in each of the door openings;

(d) means mounting said doors to the curvilinear side portions of the barrier sections for movement outwardly of the distal edge portions of the floor section between elevated positions extending across said openings and retracted positions stowed beneath the floor section of the frame;

(e) means to selectively move the doors between the elevated and retracted positions; and, said doors each comprising stress strut means to assume engagement with said barrier sections when the door is in the elevated position to impart rigidity to the frame.

4,940,283

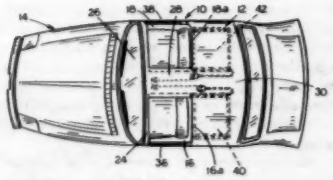
T-TOP ROOFING SYSTEM

Gilbert G. Androy, 510 Marion Ave., Malvern, Iowa 51551

Filed Jul. 31, 1989, Ser. No. 386,775

Int. Cl.[5] B60J 7/19

U.S. Cl. 296—216 **8 Claims**



1. A T-top roofing system, comprising:

a motor vehicle having a roof spaced above a passenger compartment;

said motor vehicle having at least a driver's seat and a forward passenger's seat, a windshield, and a forward frame member surrounding and securing said windshield to said motor vehicle;

said roof having first and second openings formed therein, the first opening located generally above the driver's seat and the second opening located generally above the forward passenger's seat;

said roof having a T-bar portion extending from a rearward portion of said roof, between said openings, and forwardly to said forward frame member;

said rearward portion of said roof having first and second hollow cavities formed therein adjacent to said first and second openings, and opening into said first and second openings; and

first and second roof panels independently slidably mounted in said roof for selective, adjustable movement between closed positions, wherein said roof panels completely fill said first and second openings,and retracted positions, wherein said panels are retracted within said first and second hollow cavities.

4,940,284

SEAT FOR AUTOMOBILE

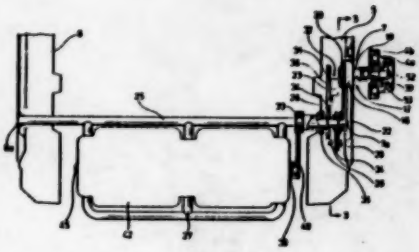
Yousetsu Nagasaka, Fujisawa, Japan, assignor to Shiroki Corporation, Fujisawa, Japan

Filed Jul. 25, 1989, Ser. No. 384,600

Claims priority, application Japan, May 8, 1989, 1-52829

Int. Cl.[5] A47C 7/46

U.S. Cl. 297—284 **15 Claims**



1. A seat for an automobile, comprising:

a seat cushion;

a seat back connected to said seat cushion, a space being formed within a lower portion of said seat back;

a rod rotatably interposed between oppositely disposed side frames of said seat back;

a hip support secured upon an intermediate portion of said rod and disposed within said space provided within said seat back;

a support board disposed upon a support frame provided within said hip support in such a manner as to be pivotably inclined back and forth, an upper portion of said support board serving as a member for engaging a lower region of the lumbar vertebrae of a person seated within said seat during a first inclination of said support board and a forward inclination of said upper portion of said support board, and a lower portion of said support board serving as a member for engaging the sacral vertebrae of said person seated within said seat during a second inclination of said support board and a forward inclination of said lower portion of said support board;

a first operation handle for inclining said support board by means of a first brake mechanism; and

a second operation handle for rotating said rod by means of a second brake mechanism so as to move said hip support in a forward and backward mode relative to said space defined within said seat back.

4,940,285

SEAT SLIDING APPARATUS FOR VEHICLES

Saburo Suzuki, Tokoname; Hiroshi Nawa, Chiryu, and Sadao Ito, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Mar. 30, 1989, Ser. No. 330,503

Claims priority, application Japan, Mar. 31, 1988, 63-044505[U]

Int. Cl.[5] A62B 35/02

U.S. Cl. 297—473 **7 Claims**

1. A seat sliding apparatus for attachment to a vehicle, comprising:

at least one lower rail fixedly secured to the vehicle, the at least one lower rail having upwardly extending first and second spaced sidewalls;

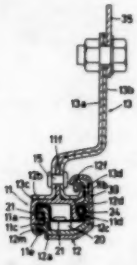
a corresponding upper rail, having first and second downwardly extending spaced sidewalls adjacent the respective first and second upwardly extending sidewalls, mounted on the lower rail;

a seat belt anchor means extending from the upper rail, the upper rail through the anchor means being subject to a

shock force in a direction separating the upper rail and the lower rail during operation of the vehicle;

bearing means including opposing surfaces of the adjacent first and second sidewalls of the upper and lower rails for slidably supporting the upper rail on the lower rail;

first interlocking safety means, including corresponding interfitting portions of the adjacent first sidewalls of the upper and lower rails; and



second safety interlocking means, including an interfitting portion of the second sidewall of the lower rail and the seat belt anchor means, the first and second safety interlocking means maintaining substantial contact between the upper and lower rails and the bearing means upon the occurrence of a shock force.

4,940,286

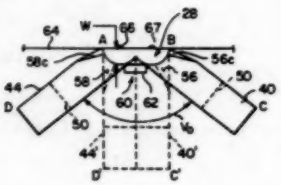
BED ATTACHMENT AND PIECE OF FURNITURE DEVICE

Tallam I. Nguti, 619 Elmwood Ter., Rochester, N.Y.

Filed Oct. 18, 1988, Ser. No. 259,263

Int. Cl.[5] A47C 7/50

U.S. Cl. 297—429 **15 Claims**



1. A piece of furniture suitable for use generally and copulatively , the piece of furniture including:

(a) a seat member separated back-to-front into an ischium support section having a narrow sitting depth , and a legs support section comprised of separate right leg and left leg support portions, said right and left leg support portions being movable inwards and outwards between an apart position and a closed position;

(b) an access spacing defined adjacent said ischium support section by said right leg and left leg support portions in an apart position, said access spacing being at least as wide as the hip-width of a user of such piece of furniture; and

(c) means for supporting said seat member at a plurality of predetermined heights for use generally and copulatively , said plurality of heights including a first predetermined copulative height that is equal to the distance between the top of the ischium support section and that of a reference surface, when the top of the ischium support section is substantially at the same level as the crotch region of a user kneeling on such reference surface adjacent to, and facing, said ischium support section.

4,940,287

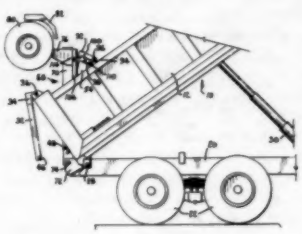
LOAD ENHANCER FOR DUMP TRUCKS

John P. Ritchie, Wichita, Kans., assignor to Proc Products, Inc., Wichita, Kans.

Filed Jun. 23, 1989, Ser. No. 370,841

Int. Cl.[5] B62D 61/10

U.S. Cl. 298—23 R **20 Claims**



1. Apparatus for distributing the load borne by a dump truck having a dump bed supported for pivotal movement about a dump axis, said apparatus comprising:

a pair of gates on said dump bed spaced apart thereon and supported for hinged opening and closing movement to dump the load in the bed when the bed is raised about said dump axis and the gates are opened;

a rigid frame carrying a wheel assembly thereon and including a beam having a front end and a back end to which said wheel assembly is connected;

means for coupling said front end of the beam with the dump truck in a manner mounting the beam for movement about a substantially horizontal pivot axis between a load bearing position of the frame wherein said wheel assembly engages the ground and the frame bears part of the weight of the dump bed load and a raised position of the frame wherein said beam extends generally upwardly at a location between said gates to raise the wheel assembly above the ground;

power means for effecting movement of said frame between the load bearing position and the raised position; and

means for diverting material in the dump bed on opposite sides of said beam and out past said gates when the dump bed is raised and the gates are opened to dump the load in the dump bed.

4,940,288

EARTH ENGAGING CUTTER BIT

Stephen P. Stiffler, New Enterprise, and Wayne H. Beach, Roaring Spring, both of Pa., assignors to Kennametal Inc., Latrobe, Pa.

Continuation-in-part of Ser. No. 221,839, Jul. 20, 1988, Pat. No. 4,911,503. This application Jan. 27, 1989, Ser. No. 303,510

The portion of the term of this patent subsequent to Mar. 27, 2007, has been disclaimed.

Int. Cl.[5] E21C 35/18

U.S. Cl. 299—79 **28 Claims**

27. A cutter bit comprising:

a ferrous metal body having a longitudinal axis and a forward end;

a cemented carbide tip;

said cemented carbide tip having:

an annular rearmost surface facing said forward end of said ferrous body;

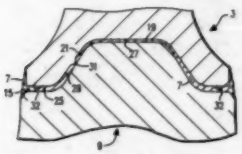
an inwardly facing surface extending forwardly and inwardly from said annular rearmost surface;

and a rearwardly facing surface located radially inwardly

of said inwardly facing surface and forwardly of said annular rearmost surface;

a braze joint joining said rearwardly facing surface, said inwardly facing surface and said annular rearmost surface to said forward end of said ferrous body;

wherein said braze joint has an average thickness adjacent said rearwardly facing surface which is smaller than the average thickness of said braze joint adjacent said rearmost annular surface;



means disposed between said tip and said body and being formed on one thereof and protruding toward the other thereof for engaging the other and placing said tip in a spaced relationship relative to said body for facilitating formation therebetween of said braze joint having the predetermined desired thicknesses; and

wherein said protruding means includes a plurality of bumps formed on and protruding from said rearmost facing surface of said tip and being spaced from one another.

4,940,289

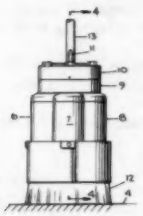
SCABBLER FOR SCABBLING FLOORS CONTAMINATED WITH HAZARDOUS MATERIALS

Stephen A. Trovato, 37 Puddingstone Dr., Boonton, N.J. 07005; Sheldon Lefkowitz, 119 Lang Dr., Coraopolis, Pa. 15108, and Robert J. Eckert, R.D. 1, Box 41, Eighty-four, Pa. 15330

Filed Jun. 1, 1988, Ser. No. 200,937

Int. Cl.[5] B25D *9/04, 17/32*

U.S. Cl. 299—37 **18 Claims**



1. Scabbling apparatus comprising:

a frame having a forward end, a rearward end and two opposed side surfaces extending divergently from said forward end toward said rearward end at an angle less than 180°;

a plurality of pneumatically operable scabbling piston and cylinder assemblies with reciprocable pistons and scabbling bits mounted on said pistons, said assemblies being carried by said frame and being mounted with said pistons reciprocable vertically and with said bits below said frame, and said assemblies being mounted with a single one thereof nearer the forward end of said frame than the remainder of said assemblies;

a handle secured to said frame and extending upwardly and rearwardly of said frame for manually moving said apparatus over a surface to be scabbled;

means for interconnecting said assemblies with a source of air supplying air at a pressure above atmospheric pressure for supplying such air to said assemblies for reciprocating said pistons; and

a tubular vacuum hose connector for receiving a vacuum hose extending from a source of vacuum, said connector extending at least to the bottom of said frame with the bottom end of said connector disposed adjacent to and intermediate said assemblies for vacuum removal of dust created by operation of said assemblies in a scabbling operation.

4,940,290

HYDRAULIC BRAKING SYSTEM

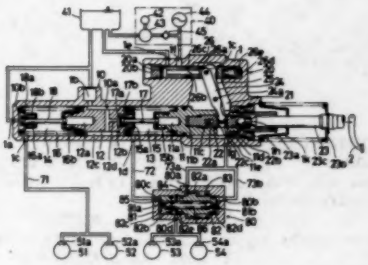
Michiharu Nishii, Toyota; Yoshihiko Tada, Oaza, and Genji Mizuno, Toyoake, all of Japan, assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Aug. 11, 1988, Ser. No. 230,877

Claims priority, application Japan, Aug. 13, 1987, 62-202250; Aug. 13, 1987, 62-202251; Sep. 17, 1987, 62-233294

Int. Cl.[5] B60T *13/00, 11/10*

U.S. Cl. 303—6.01 **2 Claims**



1. A hydraulic braking system for automotive vehicles comprising:

a powered hydraulic pressure source for boosting a brake fluid pressure to a predetermined pressure and transmitting a powered hydraulic pressure;

a reservoir for storing brake fluid;

a master cylinder for receiving the brake fluid pressure from the reservoir to a pressure chamber and transmitting the brake fluid pressure from said pressure chamber by a reactive piston slidably positioned in the master cylinder and which is tensioned by a return spring in response to movement of a brake pedal;

a dynamic hydraulic pressure control system for adjusting and transmitting the powered hydraulic pressure from said powered hydraulic pressure source in response to one of brake pedal movement and said brake fluid pressure;

a plurality of wheel cylinders one of which is connected to each wheel and connected through a divided dual passage system to said dynamic hydraulic pressure control system and said master cylinder; and

a changeover means for changing over the connection between said wheel cylinders and said dynamic hydraulic pressure control system when the powered pressure transmitted from said dynamic hydraulic pressure control system is less then the predetermined pressure and introducing one of said brake fluid pressure and said powered pressure to said wheel cylinders through said divided dual passage systems, said changeover means includes a changeover valve for selectively changing over from a first position to connect said dynamic hydraulic pressure control system and said wheel cylinders and a second position to connect said master cylinder and said wheel cylinders, said changeover valve including a valve body and a piston slidably received therein; said valve body having two inlet ports in communication with said dy-

namic hydraulic pressure control system, an inlet in communication with said master cylinder and an outlet in communication with said wheel cylinders; said piston having an interior bore in communication with said outlet, one of said two inlet ports and said inlet; first and second check valves disposed in said bore and urged toward first and second valve seats provided therein; first and second projections provided interiorly of said valve body whereby movement of said piston in response to said dynamic hydraulic pressure control system releases one of said first and second check valves from a respective one of said first and second value seats by engagement of said one of said first and second check valves with a respective one of said first and second projections, said dynamic hydraulic pressure control system being a hydraulic pressure booster for receiving the powered hydraulic pressure from said powered hydraulic pressure source and transmitting the powered hydraulic pressure which has been adjusted to the predetermined pressure in response to said brake pedal movement.

4,940,291

METHOD AND APPARATUS FOR CONTROLLING HYDRAULIC BRAKING PRESSURE FOR A VEHICLE

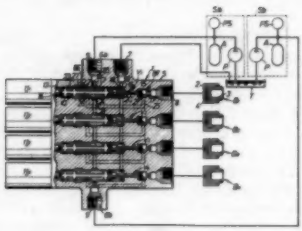
Makoto Sato, Wako, Japan, assignor to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 5, 1989, Ser. No. 293,773

Claims priority, application Japan, Jan. 7, 1988, 63-1550

Int. Cl.[5] B60T *7/00, 8/32*

U.S. Cl. 303—15 **6 Claims**



1. An apparatus for controlling a hydraulic braking pressure for a vehicle, comprising:

a housing having

a plurality of input ports leading to each other,

a plurality of input ports leading to each to a plurality of braking units,

a release port leading to an oil tank, and

a plurality of cylinder bores formed parallel to each other;

a plurality of hydraulic pressure supply sources separately connected to said input ports via check valves;

a plurality of spools each slidably fitted in each of the cylinder bores for changing over a communication state among the output ports, the input ports and the release port;

a plurality of actuators each connected to one of opposite ends of each of the spools to generate a thrust force in dependence on an amount of electricity input thereto; and

a plurality of hydraulic pressure chambers leading to said output ports and exposed to other ends of the spools so as to generate a hydraulic pressure acting against said thrust force.

4,940,292

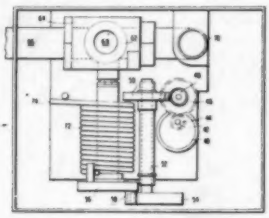
RAPID RELEASE VALVE MECHANISM

Angel P. Bezos, and Gary W. Egerton, both of Montgomery County, Md., assignors to Pulse Electronics, Inc., Rockville, Md.

Filed Apr. 19, 1989, Ser. No. 340,263

Int. Cl.[5] B60T *17/04*

U.S. Cl. 303—81 **12 Claims**



1. A rapid release valve mechanism comprising:

a ball valve including a rotating ball member and a housing;

drive means connected to said rotating ball member for rotating said ball member between closed and open positions;

an electric motor disengageably connected to drive said drive means;

torsion means connected to said ball member and prestressed by said drive means when said electric motor drives said drive means to rotate said ball member to a closed position and

actuator means for disengaging said electric motor from said drive means and allowing said torsion means to rapidly rotate said ball member to an open position.

4,940,293

DRIVE SLIP CONTROL DEVICE

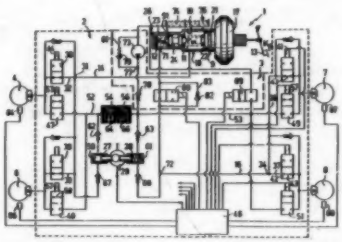
Manfred Burckhardt, Waiblingen; Andreas Faulhaber, Weinstadt, and Franz Brugger, Winnenden, all of Fed. Rep. of Germany, assignors to Daimler-Benz AG, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 301,960

Claims priority, application Fed. Rep. of Germany, Jan. 26, 1989, 3802133

Int. Cl.[5] B60T *8/64*

U.S. Cl. 303—110 **20 Claims**



1. Drive slip control device for road vehicle having driven and non-driven wheels, wheel brakes and a hydraulic twin-circuit brake installation with front axle and rear axle brake circuit subdivisions and wherein one of the brake circuit subdivisions is associated with the non-driven vehicle wheels and the other is associated with the driven vehicle wheels;

said brake circuit subdivisions having static brake circuits

whose brake pressure supply is achieved by a brake device having two outlet pressure spaces, one associated with each brake circuit subdivision;

an anti-lock braking system operating on the pump-back principle, comprising:

brake pressure control valve means associated individually with each of the driven and non-driven vehicle wheels;

two return pump means associated, one each, with the two brake circuit subdivisions;

said return pump means during pressure reduction phases of the anti-lock control, pumping brake fluid out of the wheel brake(s) then subjected to anti-lock control into output pressure spaces of the brake device with a pressure space being associated with a particular brake circuit subdivision;

said return pump means of the brake circuit of the driven vehicle wheels being used as a pressure source in brake pressure build-up phases of the drive slip control;

a drive slip two-way two position control valve means for connecting the return pump means to the pressure space of the brake device supplying pressure to the brake circuit subdivision of the driven vehicle wheels;

said drive slip control valve means being driven in response to a drive slip control signal from an electronic control unit means controlling the control phases of the drive slip control, from a basic position associated with the normal brake operation and anti-lock control operation into an excited functional position;

the basic position of the drive slip control valve means connects the output pressure space of the brake device associated with the brake circuit subdivision of the driven vehicle wheels to a main brake pipe of the brake circuit subdivision of the driven wheels;

the excited functional position of the drive slip control valve means shutting off this output pressure space from this main brake pipe while this main pipe continues to be connected to the pressure output of the associated return pump means;

the return pump means of the brake circuit of the driven vehicle wheels providing pressure to the brake circuit subdivision of the driven vehicle means in response to a brake pressure build-up control signal from the electronic control unit means;

a pressure limiting valve means being provided to limit the pressure connected to the brake circuit subdivision of the driven vehicle wheels during drive slip control operation wherein excess brake fluid flows out of the brake circuit subdivision of the driven vehicle wheels to a brake circuit subdivision of the driven vehicle wheels to a brake fluid reservoir of the brake installation when output pressure of the return pump means exceeds a specified threshold value;

said electronic control unit means generating first output signal for driving the drive slip control valve means into its excited position;

a second output signal for causing activation of the return pump means of the brake circuit subdivision of the driven vehicle wheels; and further output signals by means of which the brake pressure control valve means of the wheel brakes of the driven vehicle wheels are driven into their shut-off position as soon as the drive slip of at least one of the driven vehicle wheels reaches or exceeds a specified threshold value, whose magnitude is between a required slip value and a response threshold value of the drive slip control; and

wherein as soon as the return pump means of the brake circuit of the drive wheels is activated, the return pump means of the brake circuit of the drive wheels pumps brake fluid from the brake fluid reservoir into the main brake pipe of the brake circuit subdivision of the driven vehicle wheels.

4,940,294

HYDRAULIC ANTI-LOCK BRAKING SYSTEMS FOR VEHICLES

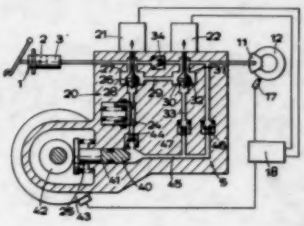
David Foster, West Midlands, England, assignor to Lucas Industries Public Limited Company, England

Filed May 12, 1989, Ser. No. 351,580

Claims priority, application United Kingdom, May 21, 1988, 8812049

Int. Cl.[5] B60T 8/40

U.S. Cl. 303—115 **8 Claims**



1. An hydraulic anti-lock braking system for a vehicle having a brake on a wheel, said system comprising a master cylinder for applying said brake, sensing means responsive to the behaviour of said braked wheel, control valve means for modulating in an anti-lock mode the behaviour of said braked wheel in response to signals from said sensing means, an expansion chamber to which fluid from said brake is released under control of said control valve means to prevent said wheel from locking, a pump for generating the energy necessary to reapply said brake automatically by withdrawing previously dumped fluid from said expansion chamber, said control valve means comprising two separate first and second upstream and downstream valve assemblies, means for interconnecting said valve assemblies in a line in series, each said valve assembly being operable independently of, and simultaneously with, said other of said valve assemblies in accordance with the said sensed behaviour of said braked wheel, said first valve assembly being movable between a first position in which said master cylinder communicates with said second valve assembly and said second valve assembly is isolated from said expansion chamber and a second position in which said master cylinder is isolated from said second valve assembly and said second valve assembly communicates with said expansion chamber, and said second valve assembly being movable between a first position in which said first valve assembly communicates with said brake and a second position in which said first valve assembly is isolated from said brake, a line between said pump and said brake, a first one-way valve located in said line between said pump and said brake on the downstream side of said second valve assembly, a line between said pump and said second valve assembly, and a second one-way valve located in parallel with said first one-way valve in said line between said pump and said second valve assembly.

4,940,295

BRAKE PRESSURE CONTROL DEVICE

Yoshiharu Adachi; Kazutaka Kuwana, and Tsuyoshi Yoshida, all of Aichi, Japan, assignors to Aisin Seiki Kabushiki Kaisha, Aichi, Japan

Filed Jul. 31, 1989, Ser. No. 387,663

Claims priority, application Japan, Jul. 29, 1988, 63-190900

Int. Cl.[5] B60T 8/32

U.S. Cl. 303—117 **1 Claim**

1. A brake pressure control device comprising:

a valve body having a valve spool capable of moving between a first position and second position:

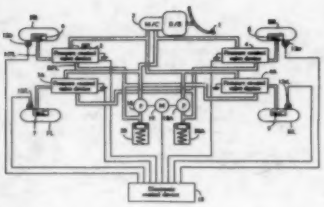
a first input port which is connected to a brake pressure source and to said valve body;

a second input port which is connected to an accumulator and to said valve body;

an output port connecting said valve body to a car wheel brake;

an output chamber in said spool for reducing the flow from said first input port to said output port and increasing the flow from said second input port to said output port in accordance with displacement of said spool from said first position to said second position in said valve body:

return driving means for imparting a driving force in a return direction from said second position to said first position in said valve spool;



an output operational space connected to said output port for applying pressure at said output port to said valve spool to move said spool toward mid second portion;

an electric coil for providing a magnetic driving force to said spool against said driving force of said return driving means of a strength corresponding to an electric current value applied to said coil; and

electric current conducting means for conducting an electric current to said coil for moving said valve body to a point between said first position and said second position.

4,940,296

PLASTIC HOUSING FOR TELEPHONE PAYSTATION

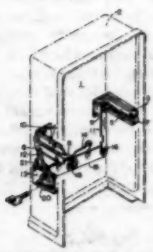
Gerald B. McGough, 2512 Monteview Dr., Huntsville, Ala. 35803

Filed Feb. 10, 1989, Ser. No. 308,776

The portion of the term of this patent subsequent to Jul. 3, 2007, has been disclaimed.

Int. Cl.[5] A47B *81/00*

U.S. Cl. 312—100 **10 Claims**



1. A housing for a telephone paystation comprising:

an upper housing assembly including a shell of plastic construction;

first and second locking rods each mounted to an opposite vertical side wall of said upper housing assembly by first and second locking rod plates, respectively;

first and second push bars each including a first end connected to a first end of said first and second locking rods, respectively;

a rocker bar pivotally mounted to said upper housing shell, including a first end of said rocker bar connected to a second end of said first push bar and a second end of said rocker bar connected to a second end of said second push bar;

at least one of said push bars further including a cam receiving slot;

a key operable cylinder lock mounted in one of said vertical side walls of said upper housing assembly shell;

said lock further including a cam located internally of said upper housing shell and adapted to engage said slot in said one of said push bars;

a lower housing assembly including a lower shell;

and a rear shell;

first and second strike plates each mounted to an opposite vertical side wall of said rear shell and each engageable by a second end of a different one of said locking rods;

whereby in response to operation of said lock by a key, said cam engages said push bar slot moving a first one of said first push bars in a first direction, and in response to said first push bar movement, said rocker bar moving a second one of said push bars in a second direction, the movement of said push bars in said first and second directions, respectively, causing said second ends of said connected locking bars to engage or in the alternative to disengage said strike plates in said rear shell to secure or in the alternative to provide access to an internal portion of said housing assembly.

4,940,297

PRODUCT DISPLAY AND MARKETING DEVICE

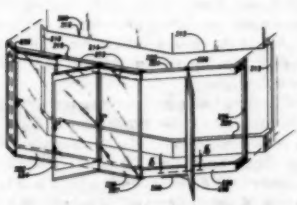
Arden L. Borgen, Des Moines, Iowa, assignor to Margaret Platt Borgen, Des Moines, Iowa

Continuation-in-part of Ser. No. 49,733, May 13, 1977, Pat. No. 4,818,043. This application Mar. 29, 1989, Ser. No. 330,596

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] A47F *3/00*

U.S. Cl. 312—138.1 **8 Claims**



1. A door assembly for a product display compartment having compartment wall provided with a door opening having an upper margin, opposite end margins, and a bottom margin, said assembly comprising:

a continuous door frame sized and shaped to conform generally to the size and shape of said door opening perimeter, said door frame being operatively attached to said compartment wall in registration with said perimeter of said door opening;

said door frame having an upper frame member, a lower frame member, and opposite end frame members defining a frame opening, each of said upper, lower, and end frame members having a flat front surface facing outwardly away from said display compartment;

a plurality of doors positioned in covering relation over said frame opening, each of said doors comprising a top edge in covering relation over said front face of said upper frame member, a bottom edge in covering relation over said lower frame member, a hinge edge, and a latching edge, said doors being made of glass and having a front planar surface facing outwardly away from said compart-

ment, said doors being in edge to edge relation with said hinge edge of each door being closely adjacent said latching edge of an adjacent one of said doors;

sealing means between said latching edges and said hinge edges of adjacent ones of said doors for providing a thermal seal therebetween;

hinge means connecting each of said doors to said door frame for hinged movement between open and closed positions about a vertical hinge axis adjacent said hinge edge of each of said doors;

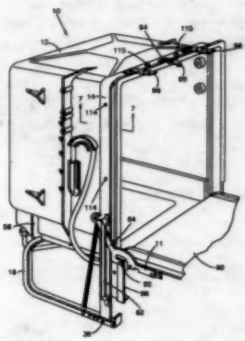
said frame opening being free from any vertical members extending between said upper and lower frame members other than said plurality of doors.

4,940,298

PLASTIC DISHWASHER TUB AND SUPPORT STRUCTURE

James R. Jackson, and Stephen H. Friskney, both of Connersville, Ind., assignors to White Consolidated Industries, Inc., Cleveland, Ohio

Filed Jun. 19, 1989, Ser. No. 367,730
Int. Cl.[5] A47B *77/06*
U.S. Cl. 312—228 **14 Claims**



1. In a dishwasher comprising a box-like tub, said tub having a bottom wall, a top wall, two side walls, a back wall and an open front; and a metal frame supporting said tub above a mounting surface, said frame having a main member supporting a front portion of the tub and a secondary member supporting a remainder of the tub, the improvement comprising said secondary member being formed from and consisting of a single piece, wherein the single piece has a length substantially greater than its width and depth and is formed in a U-shape along its length with a portion of each of the legs of the U additionally formed into arms extending out of the plane of the U.

4,940,299

STORAGE CABINET

James E. Lazenby, 808 Daisy St., Monroeville, Ala. 36461

Continuation-in-part of Ser. No. 218,975, Jul. 14, 1988, abandoned. This application Jun. 2, 1989, Ser. No. 360,381
Int. Cl.[5] A47B *88/00*
U.S. Cl. 312—285 **10 Claims**

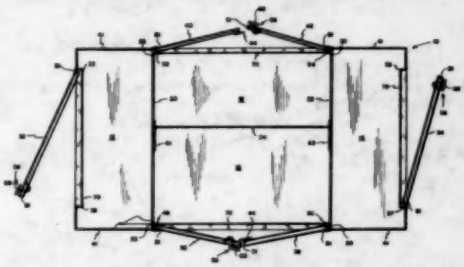
1. A tool and construction equipment storage cabinet for use at construction sites and plant buildings or the like, said storage cabinet comprising:

a top, a pair of substantially parallel ends, a pair of substantially parallel sides, a base comprising a plurality of channel iron members disposed in secured relation to form a substantially rectangular frame having a pair of spaced cross members, and a floor member secured to said channel members;

a first structural, continuous partition disposed between said top and said base;

a second structural, continuous partition positioned between said top and bottom in secured relation thereto, said second structural, continuous partition being in substantially parallel relation with said first structural, continuous partition;

a third structural, continuous, intermediate partition disposed in substantially normal relation to and extending in secured relation between said first and second partitions intermediate each end edge thereof, said third partition vertically extending between said floor member and said top, said partitions having a substantially H-shaped configuration and forming an internal rear wall of each of four compartments formed in said cabinet, each of said four compartments having a forward open portion;



a door assembly extending substantially across each of said four compartments, each door assembly disposed for enclosing a respective one of said four compartments at said forward portion thereof;

a first plurality of panel members, each substantially forming the ends, sides, and corners of said cabinet, each of said panel members including a pair of spaced vertical edges and an intermediate portion, said panels being bent at said intermediate portions to form a rigid corner, and each of said vertical edges of each said panel being positioned in one said end and one said side of said cabinet and being formed to provide vertical door frames for each said door; and

a second plurality of panel members secured to and extending upwardly from said base, each extending at the base of said cabinet between said pairs of vertical door frames and formed to provide a lower door stop for each door.

4,940,300

CATHODE RAY TUBE WITH AN ELECTROPHORETIC GETTER

Ettore Giorgi, Milan, Italy, assignor to SAES Getters SpA, Milan, Italy

Filed Mar. 8, 1985, Ser. No. 709,650
Claims priority, application Italy, Mar. 16, 1984, 20096 A/84
Int. Cl.[5] H01J *17/24, 31/00*
U.S. Cl. 313—559 **5 Claims**

1. A cathode ray tube comprising:

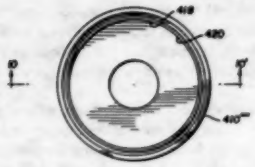
A. a cylindrical neck;

B. a feed-through sealing element positioned at one end of the neck, said sealing element closing said end of the neck;

C. an electron gun within said neck, said electron gun being supported by the sealing element; and

D. a getter device located within the neck, said getter device comprising a getter support having an electrophoretic coating thereon of at least one member selected from the

group consisting of Zr-Al alloys, Zr-Ni alloys, Zr-Fe alloys, Zr-Ti-Fe alloys, Zr-M_1-M_2 alloys wherein M_1 is



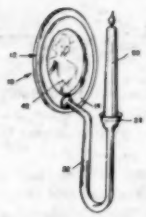
vanadium or niobium and M_2 is nickel or iron, Zr, Ta, Hf, Ni, Ti, Th, U and hydrides thereof.

4,940,301

METHOD AND APPARATUS FOR ENHANCING A HOLOGRAPHIC IMAGE BY CANDLELIGHT

Katalin Sallai, 4470 Ventura Canyon Ave., No. F 306, Sherman Oaks, Calif. 91423

Filed Dec. 23, 1988, Ser. No. 288,946
Int. Cl.[5] G03H *1/00*; F21V *33/00, 35/00*
U.S. Cl. 350—3.6 **16 Claims**



1. An apparatus for enhancing a holographic image, comprising:

a. a vertically aligned frame member comprising a front wall having a vertically aligned opening therein and a rear wall separated from the front wall by a gap;

b. a vertically aligned first optically transparent member;

c. a vertically aligned second optically transparent member;

d. said first optically transparent member and said second optically transparent member set within the gap of said frame such that said first optically transparent members lies adjacent said front wall with a portion of the first optically transparent member aligned with the opening in said front wall and said second optically transparent member set behind and adjacent to the first optically transparent member;

e. a photographic emulsion including a holographic picture attached to said first optically transparent member and located between said first optically transparent member and said optically transparent member and aligned with the opening in the front wall of said frame member;

f. a candle mounting means including a candle retaining portion set in front of the front wall of said frame member; and

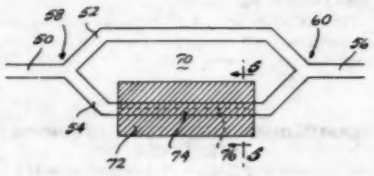
g. a candle retained within the candle retaining portion of said candle mounting means in a manner so as to enable the flame from the candle when lighted to illuminate the holographic picture from in front of the holographic picture and illuminate the holographic picture at a height equal to or above the lowermost portion of the opening in said front wall of said frame to thereby cause the holographic picture to become visible.

4,940,302

INTEGRATED OPTICS WAVEGUIDES WITH LARGE PHASE SHIFTS

Theodore L. Houk, and R. Aaron Falk, both of Seattle, Wash., assignors to The Boeing Company, Seattle, Wash.

Filed Mar. 13, 1989, Ser. No. 322,532
Int. Cl.[5] G02B *6/12*
U.S. Cl. 350—96.12 **11 Claims**



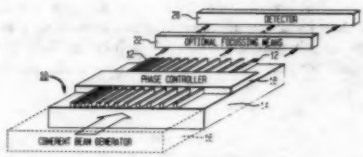
6. An interferometer formed in an electro-optic substrate comprising lithium, the interferometer comprising first and second arms along which an optical signal can pass, the first arm comprising a proton exchange region formed in the substrate, and a waveguide formed within the proton exchange region, the waveguide having associated with it a lowest guided mode that defines a spatial distribution of a field of an optical signal traveling along the waveguide, the dimensions of the waveguide and the proton exchange region being selected such that substantially all of the field of the lowest guided mode is contained within the proton exchange region.

4,940,303

OPTICAL SYSTEM COMPRISING NON-UNIFORMLY SPACED ARRAY OF PARALLEL OPTICAL WAVEGUIDE ELEMENTS

Joseph H. Abeles, Highland Park, and Robert J. Deri, Atlantic Highlands, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Oct. 28, 1988, Ser. No. 264,096
Int. Cl.[5] G02B *6/12*
U.S. Cl. 350—96.11 **17 Claims**



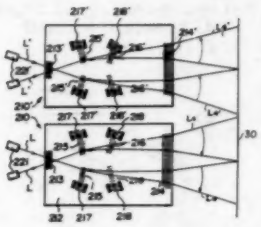
1. A far field optical scanning system comprising a coherent light source the output from which provides input light simultaneously to each element of an optical waveguide array comprising a plurality of parallel spaced waveguide elements, modulation means coupled to the waveguide elements of the array for modulating the light passing through the waveguide array, and far field optical detector means, the system characterized in that the optical waveguide array has a nonconstant spacing between adjacent parallel waveguide elements of said array.

4,940,304

OPTICAL DEFLECTING APPARATUS

Masami Hatori, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 201,976, Jun. 3, 1988, abandoned. This application Jul. 24, 1989, Ser. No. 384,113
Claims priority, application Japan, Jun. 3, 1987, 62-139472; Jun. 25, 1987, 62-158610; Jun. 25, 1987, 62-158611
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.13 24 Claims



19. An optical deflecting apparatus comprising:

(i) an optical waveguide formed of a material allowing propagation of surface acoustic waves therethrough,

(ii) a first surface acoustic wave generating means for generating a first surface acoustic wave, which advances in a direction intersecting an optical path of a first guided optical wave advancing inside of said optical waveguide and diffracts and deflects said first guided optical wave, in said optical waveguide,

(iii) a second surface acoustic wave generating means for generating a second surface acoustic wave, which advances in a direction intersecting an optical path of a second guided optical wave advancing inside of said optical waveguide and diffracts and deflects said second guided optical wave, in said optical waveguide,

(iv) a third surface acoustic wave generating means for generating a third surface acoustic wave, which advances in a direction intersecting the optical path of said first guided optical wave diffracted by said first surface acoustic wave and diffracts and deflects said first guided and diffracted optical wave in a direction that amplifies the deflection caused by said diffraction, in said optical waveguide, and

(v) a fourth surface acoustic wave generating means for generating a fourth surface acoustic wave, which advances in a direction intersecting the optical path of said second guided optical wave diffracted by said second surface acoustic wave and diffracts and deflects said second guided and diffracted optical wave in a direction that amplifies the deflection caused by said diffraction, in said optical waveguide,

wherein said first surface acoustic wave generating means and said third surface acoustic wave generating means are formed to continuously change the frequencies of said first surface acoustic wave and said third surface acoustic wave and the directions of advance thereof while satisfying the conditions of

$$k1+K1=k2, \text{ and}$$

$$k2+K2=k3,$$

wherein k1 and k2 respectively denote wave vectors of said first guided optical wave before and after being diffracted by said first surface acoustic wave, k3 denotes a wave vector of said first guided optical wave after being diffracted by said third surface acoustic wave, and K1 and K2 respectively denote wave vectors of said first surface acoustic wave and said third surface acoustic wave,

said second surface acoustic wave generating means and said fourth surface acoustic wave generating means are formed to continuously change the frequencies of said second surface acoustic wave and said fourth surface acoustic wave and the directions of advance thereof while satisfying the conditions of

$$k4+K3=k5, \text{ and}$$

$$k5+K4=k6$$

wherein k4 and k5 respectively denote wave vectors of said second guided optical wave before and after being diffracted by said second surface acoustic wave, k6 denotes a wave vector of said second guided optical wave after being diffracted by said fourth surface acoustic wave, and K3 and K4 respectively denote wave vectors of said second surface acoustic wave and said fourth surface acoustic wave, and

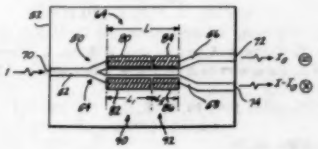
said first surface acoustic wave generating means, said second surface acoustic wave generating means, said third surface acoustic wave generating means, and said fourth surface acoustic wave generating means are disposed so that said first guided optical wave and said second guided optical wave radiated out of said optical waveguide scan without overlapping each other on a predetermined surface.

4,940,305

OPTICAL SWITCH BASED ON 1×2 DIRECTIONAL COUPLER

Suwat Thaniyavarn, Bellevue, Wash., assignor to The Boeing Company, Seattle, Wash.

Filed Mar. 22, 1989, Ser. No. 227,826
Int. Cl.[5] G02B 6/10
U.S. Cl. 350—96.14 9 Claims



1. An optical switch, comprising:

an electro-optic substrate;

a pattern of optical waveguides formed in the substrate, the pattern comprising an input waveguide that branches to form first and second output waveguides, at least one output waveguide having a propagation constant that can be varied by an electric field;

the first and second output waveguides both passing through a coupling region within which the output waveguides are positioned so as to produce evanescent field coupling therebetween;

means for selectively generating an electric field in a first section of the coupling region to thereby produce in the first section a first difference $\Delta\beta_1$ between the propagation constant of the first waveguide and the propagation constant of the second waveguide:

means for selectively generating an electric field in a second section of the coupling region to thereby produce in the second section a second difference $\Delta\beta_2$ between the propagation constant of the first waveguide and the propagation constant of the second waveguide, the first and second section having respective lengths that differ from one another, $\Delta\beta_1$ and $\Delta\beta_2$ having opposite polarities from one another; and

whereby an optical input signal introduced into the input

waveguide can be switched to a selected output waveguide by generating the first and second electric fields.

4,940,306

STAR NETWORK OPTICAL TRANSMISSION SYSTEM

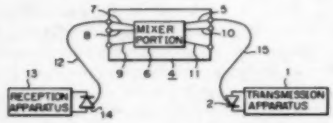
Tadayoshi Kitayama; Kiwami Matsushita, and Kuniaki Motoshima, all of Kanagawa, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 23, 1989, Ser. No. 300,786

Claims priority, application Japan, Jan. 28, 1988, 63-18083; Mar. 4, 1988, 63-51136; Nov. 26, 1988, 63-298799

Int. Cl.[5] G02B *6/28*

U.S. Cl. 350—96.16 **14 Claims**



1. A star network optical transmission system having a star coupler as a center node, said star network optical transmission system comprising: a star coupler provided with an optical fiber at an input portion and an output portion, an optical transmission apparatus having a laser with a wavelength of λ as a light source; an up optical fiber exhibiting a single mode transmission characteristic at a wavelength of λ and connecting said optical transmission apparatus to said star coupler; an optical reception apparatus; and a down optical fiber exhibiting a multimode transmission characteristic at a wavelength λ and connecting said optical reception apparatus to said star coupler.

4,940,307

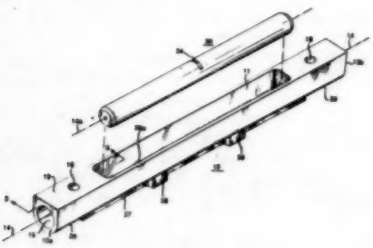
OPTICAL FIBER SPLICE

James A. Aberson, Atlanta; Raymond P. DeFabritis, Lilburn; David N. Ridgway, Conyers, and William A. Vicory, Duluth, all of Ga., assignors to AT&T Bell Laboratories, Murray Hill, N.J.

Filed Dec. 19, 1988, Ser. No. 286,441

Int. Cl.[5] G02B *6/38*

U.S. Cl. 350—96.21 **10 Claims**



1. Apparatus for effecting an optical fiber splice, comprising:
an elongate housing comprising:
a top surface;
an open recess formed lengthwise into said top surface, said recess having a semicircularly shaped floor having a center axis and two end walls; and
an elongate, cylindrical fiber-aligning glass member having a length substantially the same as the distance between said end walls of said recess, and having an exterior radius substantially the same as the radius of said semicylindrical floor of said recess, said member comprising a circular cross-section capillary track formed along the longitudinal axis of said member, the capillary track longitudinal axis and the center axis of said housing being in predetermined relationship when said member is disposed in said recess of said housing.

4,940,308

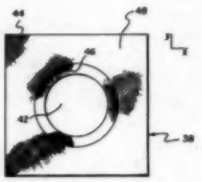
LASER BEAM STOP

John R. Debesis, Penfield, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jun. 27, 1988, Ser. No. 211,938

Int. Cl.[5] G02B *27/46, 27/58*

U.S. Cl. 350—162.2 **13 Claims**



1. A soft-edge stop for a laser beam, including:
a passing zone, a blocking zone and a transition zone between said passing zone and said blocking zone;
said transition zone including a diffraction grating, the diffraction effeciency of said diffraction grating having a first value adjacent said passing zone, a second, different value adjacent said blocking zone and varying, in diffraction efficiency, between said first and second values elsewhere in the transition zone.

4,940,309

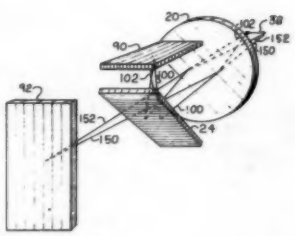
TESSELLATOR

Peter S. Baum, 9 Eastis St., #2R, Cambridge, Mass. 02140

Continuation of Ser. No. 40,243, Apr. 20, 1987, abandoned. This application Jan. 25, 1989, Ser. No. 303,956

Int. Cl.[5] G02B *27/14*

U.S. Cl. 350—171 **10 Claims**



1. A tessellator comprising
(a) a focusing means used to form a set of electromagnetic waves into a clear image,
(b) a plurality of target elements, upon each of which is directed a segment of said clear image,
(c) at least one reflective means positioned along the path taken by the electromagnetic waves as they travel from said focusing means to said target elements, said reflective means positioned farther from said focusing means than a minimum tessellating distance to direct at least one section of said electromagnetic waves to at least one of said individual target elements.

4,940,310

OPTICAL SCANNING DEVICE USING PLURAL SOURCES OF DIFFERING WAVELENGTHS

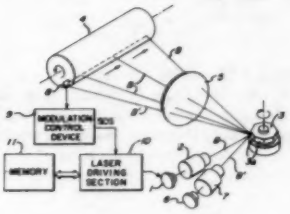
Akiyoshi Hamada, Toyokawa, Japan, assignor to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Division of Ser. No. 27,750, Mar. 19, 1987, abandoned. This application May 25, 1989, Ser. No. 356,879

Claims priority, application Japan, Mar. 19, 1986, 61-62585; Mar. 19, 1986, 61-62586; Mar. 19, 1986, 61-62587; Mar. 20, 1986, 61-63753

Int. Cl.[5] H01J 3/14

U.S. Cl. 250—236 9 Claims



1. An optical scanning device for scanning a photosensitive member, comprising:

first optical beam generating means for generating a first beam having a wavelength range within a sensitivity range of the photosensitive member, the first beam being modulated based on an image signal and directed along a first optical path;

beam scanning means having at least one reflecting face for scanning the first beam on a photosensitive face of the photosensitive member;

second optical beam generating means for generating a second beam to be applied to the reflecting face and directed along a second optical path separate from the first optical path, a design wave length of the second beam being within a wave length range where a sensitivity of the photosensitive face is substantially lower than the wavelength of the first beam; and

a light receiving element for detecting the second beam having been reflected by the reflecting face and for outputting a signal for starting the modulation of the first beam.

4,940,311

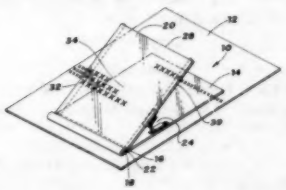
ADJUSTABLE MAGNIFYING DEVICE

Daniel F. Buszek, and Frank J. Buszek, both of 19626 Woodmont, Harper Woods, Mich. 48225

Filed Dec. 9, 1988, Ser. No. 282,055

Int. Cl.[5] G02B 7/02

U.S. Cl. 350—245 3 Claims



1. A device for magnifying indicia embodied in a tangible medium, such as a writing, drawings, photographs, pictures and the like, the device comprising:

a transparent base for placement over the tangible medium having indicia to be magnified, said transparent base having a bottom side edge;

a U-shape lip connected to said bottom side edge of said transparent base, said U-shaped lip extending upwardly from and inwardly over said bottom side edge of said base;

a magnifying sheet having a basal edge, said basal edge being foldably connected to said magnifying sheet, said basal edge being engaged by said U-shaped lip; and

an adjustable fastener extending between said magnifying sheet and said transparent base, said adjustable fastener permitting said magnifying sheet to be selectively supported in an inclined position above said transparent base so that the indicia in the tangible medium to be viewed are magnified in an amount determined by the selected angle of inclination of said magnifying sheet and said transparent base.

4,940,312

SCANNING PRISM

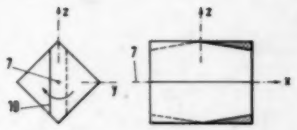
Otto Hofmann, Kirchstockach, Fed. Rep. of Germany, assignor to Messerschmitt-Bölkow-Blohm GmbH, Munich, Fed. Rep. of Germany

Filed Sep. 23, 1988, Ser. No. 249,355

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3732068

Int. Cl.[5] G02B 5/04, 26/10

U.S. Cl. 350—286 3 Claims



1. Optical scanning means, for use in a scanning system, for producing scanning lines of an object as the system moves past the object, said optical scanning means comprising:

a quadratic two-part scanning prism rotatable around an axis of symmetry, said prism comprising a prism body having opposite roof edges, and having a reflecting surface inclined at an angle β with respect to the axis of rotation and intersecting the middle of the axis of rotation and intersecting the roof edges of the prism body on opposite sides of the middle, said angle β being such that crossing scanning lines are produced when the prism is rotated and the system moved past the object.

4,940,313

LIQUID CRYSTAL DISPLAY HAVING A BUILT-IN PHOTOELECTRIC CONVERSION DEVICE

Toshiji Hamatani, Atsugi, Japan, assignor to Semiconductor Energy Laboratory Co., Ltd., Atsugi, Japan

Filed Jul. 18, 1989, Ser. No. 381,427

Claims priority, application Japan, Jul. 19, 1988, 63-179468

Int. Cl.[5] G02F 1/133

U.S. Cl. 350—342 6 Claims

5. A liquid crystal display comprising:

a pair of first transparent substrates;

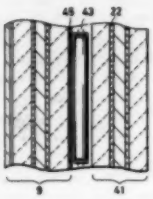
transparent electrode arrangements provided on the inside surfaces of said transparent substrates in order to define a plurality of pixels;

a liquid crystal layer disposed between said substrates;

a transparent second substrate overlappingly juxtaposed parallel with said transparent first substrates;

a photoelectric conversion device formed on said transparent second substrate, said conversion device comprising a

pair of transparent conductive films and photosensitive semiconductor film located therebetween; and



a light source provided between said first substrates and said second substrate.

4,940,314

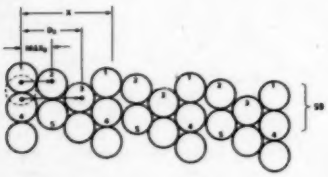
VARIABLE WAVELENGTH DISCRETE OPTICAL IMAGE BARS HAVING PASSIVELY ENHANCED SPATIAL ADDRESSING CAPACITY

David L. Hecht, Menlo Park, Calif., assignor to Xerox Corporation, Stamford, Conn.

Continuation of Ser. No. 733,356, May 13, 1985, abandoned. This application Dec. 23, 1988, Ser. No. 289,496

Int. Cl.[5] G01D *15/14*; G02F *1/01*

U.S. Cl. 350—355 **18 Claims**



15. The combination comprising

a variable wavelength discrete optical image bar for sequentially generating successive, mutually independent pixel patterns at N different wavelengths, where N≧2 and each of said pixel patterns contains a plurality of pixels, and

an optical system for superimposing said pixel patterns on an output image plane so that the pixels of each of said pixel patterns are spatially distributed generally uniformly on said image plane on respective laterally displaced centers while said image plane is advancing in an orthogonal cross-line direction with respect to said image bar;

said optical system including optical means for dispersing said pixel patterns in said cross-line direction with respect to said image plane in accordance with their respective wavelengths to substantially completely compensate on a pixel pattern-by-pixel pattern basis for the cross-line advance of said image plane.

4,940,315

PATTERNING OF INSULATOR ON ELECTROCHROMIC MATERIAL AS DETERMINANT FOR AREA OF COLORATION

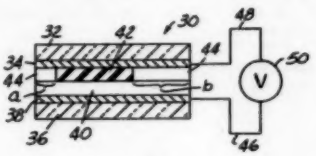
Hulya Demiryont, Dearborn, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Oct. 5, 1988, Ser. No. 253,655

Int. Cl.[5] G02F *1/17*

U.S. Cl. 350—357 **14 Claims**

8. An electrochromic device comprising two substrates and therebetween: one electrode layer; an electrochromic layer; an insulator material which is (i) non-ionically conductive and (ii) electronically insulating; a solid ion conductive material; and another electrode layer, said one electrode layer and said other electrode layer being transparent and each electrode layer being in contact with a respective one of said substrates, said solid ion conductive layer being adapted to communicate ions to and from said electrochromic layer upon application of a voltage across said electrode layers, wherein areas of said



electrochromic layer which are not to be colorable during operation of said device are in contact with said insulator material and not in contact with said solid ion conductive material, and said colorable areas of said electrochromic layer, which are to be colored upon application of a voltage across said electrodes, are in contact with said solid ion conductive material.

4,940,316

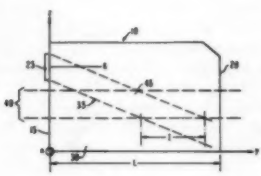
APPARATUS AND METHOD FOR INCREASING THE EFFICIENCY OF AN ACOUSTO OPTIC DIFFRACTIVE DEVICE

Gerald B. Brandt, Edgewood Boro, Pa., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed May 13, 1988, Ser. No. 194,064

Int. Cl.[5] G02F *1/01*

U.S. Cl. 350—358 **6 Claims**



1. An acousto optic tunable filter system comprising:

a crystal;

acoustic means for launching acoustic energy into said crystal so as to maximize overlap of said acoustic energy within said crystal;

means for modulating the acoustic energy launched into said crystal in accordance with a reference signal;

means for illuminating said crystal with light so that the light is diffracted by said overlapping acoustic energy; means for providing said reference signal; and

means for detecting light exiting said crystal being in phase with said reference signal.

4,940,317

ELECTRIC HEATING DEVICE FOR MIRROR

Ronnie Reuben, c/o 555 Chabanel West, Suite 1009, Montreal, Quebec, Canada

Filed Aug. 1, 1988, Ser. No. 226,995

Int. Cl.[5] G02B *5/08*; B60R *1/02*; H05B *1/00*

U.S. Cl. 350—588 **11 Claims**

1. A mirror heating device for securement to a rear thermally conductive surface of a mirror for heating a mirror to a temperature exceeding ambient temperature about said mirror when used in an area where there is water vapor in the air, said device comprising a first electrically insulated conductive strip

adhesively securable adjacent an edge of said rear coated surface of said mirror, connecting means or applying a DC voltage to said conductive strip, a second electrically insulated conductive strip located adjacent an opposed edge of said rear coated surface of said mirror, a ground connection connected to said second strip, intermediate electrically insulating resistive conductors extending between said first and second conductive strips and in thermal conductive contact therewith to heat said mirror, and electrical insulating means extending over said first and second conductive strips and said intermediate resistive conductor means for insulting a back surface of said mirror, said thermally conductive surface being a thin metal plate adhesively secured over at least a major portion of a rear surface of said mirror, said conductive strip adjacent said lower edge being connected to said connecting means which is a wire conductor secured to a positive terminal of a DC voltage source, a third electrically insulated conductive metal strip

insulatingly secured adjacent one of said edges of said metal plate, said third metal strip being axially aligned with said first metal strip, said second metal strip being an elongated strip, said first strip having a plurality of electrically insulated conductors connected thereto and a portion of said second metal strip and extending in spaced-apart parallel alignment and in adhesive contact with said thin metal plate, whereby to heat said plate by heat transfer when current flows in said conductors, and a further plurality of electrically insulated conductors connected to said third metal strip and a portion of said second metal strip and also in adhesive contact with said metal plate, said first conductive strip being connected to a positive terminal of a DC voltage source by said connecting means, said third conductive strip being grounded, said metal strips being sandwiched between opposed electrical insulating layers, at least said layer adjacent said rear coated surface of said mirror having an adhesive surface for securing said metal strip thereto.

4,940,318

GRADIENT MEMBRANE DEFORMABLE MIRROR HAVING REPLACEABLE ACTUATORS

Mark A. Exley, Ayer, and Victor G. Salemme, Concord, both of Mass., assignors to Itek Corporation, Lexington, Mass.

Filed Nov. 3, 1988, Ser. No. 266,616
Int. Cl.[5] G02B 5/08, 5/18
U.S. Cl. 350—611 **5 Claims**

1. A deformable mirror having a continuous reflective surface, said deformable mirror being comprised of:

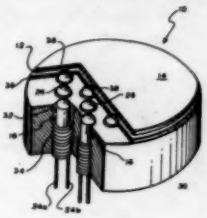
(a) a base having a plurality of apertures passing therethrough;

(b) a plurality of electrically operable actuators, each of said actuators being manufactured from an electrodistortive material which may be elongated in response to an electrical signal applied thereto, each of said actuators having a rear end portion and a forward extremity, each of said actuators being received in each of said apertures in said base;

(c) means for retaining each of said actuators in each of said apertures;

(d) a facesheet above said base, said facesheet having a reflecting surface on one side thereof for reflecting optical signals therefrom; and

(e) a retraction membrane located between said facesheet and said base and fastened to said base and to the side of said facesheet opposite said reflecting surface, each of said actuators having their forward extremities in contact with said retraction membrane, said retraction membrane being manufactured from a material which will flex when one or more of said actuators are biased against said retraction membrane by the application of an electrical signal to one or more of said actuators, and which will provide a restoring force to each of said actuators when electrical signals applied to said actuators are reduced or removed, said retraction membrane further being characterized in that



the thickness of said retraction membrane is reduced around the point at which each actuator contacts the retraction membrane to provide symmetrical reduced stress conditions around the point at which each actuator contacts said retraction membrane;

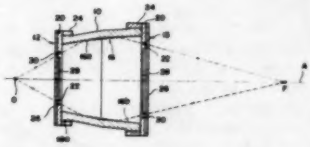
whereby said actuators may have electrical signals applied thereto selectively changed to provide for the controlled deformation of the reflecting surface of the facesheet, said retraction membrane restoring said facesheet to an undeformed state upon the reduction or removal of electrical signals from said actuators.

4,940,319

X-RAY MIRROR APPARATUS AND METHOD OF MANUFACTURING THE SAME

Katsunobu Ueda; Mitsuo Sumiya, and Michio Baba, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 25, 1989, Ser. No. 342,793
Claims priority, application Japan, Apr. 28, 1988, 63-104096
Int. Cl.[5] G02B 5/08
U.S. Cl. 350—613 **12 Claims**



9. An X-ray mirror apparatus comprising:

a substantially cylindrical mirror body having opened ends and an inner surface which forms a reflecting mirror surface having a surface of revolution, said reflecting mirror surface having an X-ray focal spot located outside the mirror body and on an axis of the reflecting mirror surface;

light shielding means provided on at least one open end of the mirror body, for allowing only the passage of X-rays entering onto the reflecting mirror surface and X-rays reflected on the reflecting mirror surface, said light shielding means including a light shielding plate provided to block said one open end, a substantially annular slit allowing passage of the X-rays, and fitting means fitted to said

one end of the mirror body, for positioning the light shielding plate with respect to the mirror body so that the slit is located coaxial with the axis of the reflecting mirror surface; and

means for visually observing the X-ray focal spot, said observing means including a through hole formed in the light shielding plate to be coaxial with the reflection mirror surface, light emitting means provided outside the mirror body, for emitting visible light, and an optical system for directing the visible light emitted from the light emitting means toward the X-ray focal spot through the through hole and the interior of the mirror body and imaging the visible light on the X-ray focal spot.

4,940,320

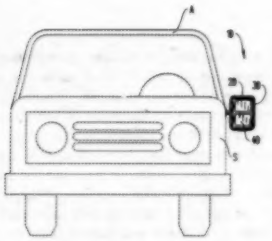
VEHICLE REAR VIEW MIRROR

Lara L. Tribble, 1513 Harvard Dr., Brunswick, Ohio 44212

Filed Jul. 10, 1989, Ser. No. 377,128

Int. Cl.[5] G02B *7/18*; B60R *1/06*

U.S. Cl. 350—616 **3 Claims**



1. A vehicle rear view mirror, comprising:

a generally rectangular open frame formed from a cylindrical member;

a first cylindrical sleeve adjustably secured on said cylindrical member;

a first transverse stem secured to said first sleeve;

a mounting plate for securement to a vehicle;

a first cylindrical socket on said mounting plate having an undercut circular groove;

an enlarged cylindrical end on said first stem received for rotation in said first cylindrical socket;

an enlarged resilient circumferential rib on said first stem received in said circular groove;

a second cylindrical sleeve adjustably secured on said cylindrical member above said first cylindrical sleeve;

a second cylindrical socket on said second sleeve having an undercut circular groove;

a second transverse stem having an enlarged cylindrical end received for rotation in said second cylindrical socket;

an enlarged resilient circumferential rib on said second stem received in said circular groove;

a first mirror mounted within said frame on said second stem;

a third cylindrical sleeve adjustably secured on said cylindrical member below said first cylindrical sleeve;

a third cylindrical socket on said third sleeve having an undercut circular groove;

a third transverse stem having an enlarged cylindrical end received for rotation in said third cylindrical socket;

an enlarged resilient circumferential rib on said third stem received in said circular groove; and

a second mirror mounted within said frame on said third stem, said first and second mirrors mounted for independent compound adjustment in vertically spaced relation within said frame.

4,940,321

DRIVE UNIT FOR ELECTRICALLY DRIVEN REMOTE-CONTROLLED MIRROR

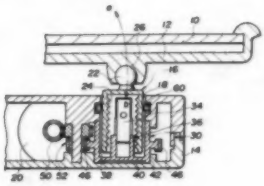
Norio Yoshida, Isehara, Japan, assignor to Ichikoh Industries, Ltd., Tokyo, Japan

Filed Nov. 23, 1988, Ser. No. 275,713

Claims priority, application Japan, Nov. 26, 1987, 62-178891[U]; Nov. 26, 1987, 62-178893[U]; Jul. 25, 1988, 63-97409[U]

Int. Cl.[5] B60R *1/06*; G02B *7/18*

U.S. Cl. 350—633 **8 Claims**



1. A drive unit for an electric remote control mirror, comprising:

supporting means for holding within a mirror housing a mirror body having a mirror fixed thereon, said supporting means including a housing member fixed inside said mirror housing and means for pivotably supporting said mirror body;

two ball bases mounted on the back side of said mirror body, one of which lies on a lateral pivot axis while the other lies on a longitudinal pivot axis, said lateral and longitudinal axes being perpendicular to each other;

a pair of hollow cylindrical screw rods, each being internally threaded on the inner wall thereof, provided at the end portion thereof with a ball portion which fits in a corresponding one of said ball bases, and axially movable through a cylindrical hole formed in said housing member while being unrotatable with respect to said housing member;

a pair of rotation members rotatably mounted within said housing member, each composed of a shaft provided with at least two arm members having plural screw threads coupled to the screw threads of each of said screw rods and which are spaced apart from each other, a hollow cylindrical rotation body holding therein said screw rod and shaft and having a gear integrally formed therewith on the outer circumference thereof, and a plurality of radially extending connection members to provide a connection between said shaft and rotation body and being formed relatively thin so as to resiliently be deformable;

reduction gear means connected with the gear formed on the rotation body of said rotation member to transmit a driving force to each of said rotation member; and

an electric motor means for driving said rotation member through said gear means;

wherein said rotation member is arranged in a receiving recess formed on the bottom of said housing member and rotates with the whole circumference of the lower end of said cylindrical rotation body being in contact with said receiving recess and each of said connection members is integrally formed with said shaft and said rotation member spaced from the bottom wall of said receiving recess.

4,940,322

ELECTRIC REARVIEW MIRROR SYSTEM FOR MOTOR VEHICLE

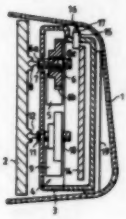
Tadanao Hamamoto; Tadashi Wakiya, and Kazunari Hayasi, all of Aichi, Japan, assignors to Kabushiki Kaisha Tokai Rika Denki Seisakusho, Aichi, Japan

Filed Oct. 25, 1988, Ser. No. 261,852

Claims priority, application Japan, Oct. 26, 1987, 62-163227; Nov. 18, 1987, 62-175998

Int. Cl.[5] B60R *1/08*; G02B *7/18*; G05B *11/00*; G08C *15/06*

U.S. Cl. 350—637 8 Claims



1. An electric rearview mirror system for a motor vehicle body, comprising:

a mirror unit having a mirror body;

means for housing said mirror unit;

means for driving said mirror body, said driving means being provided in said housing means;

switch means, provided in the vehicle body, for providing parallel command signals;

first control means, provided in the vehicle body, for converting said parallel command signals into a serial command signal;

second control means, provided in said housing means, for converting said serial command signal into parallel driving signals; and

operating means, enabled by said parallel driving signals, for operating said driving means.

4,940,323

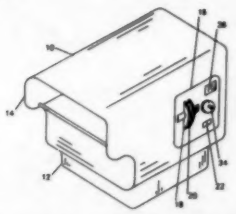
LIGHT TESTING AND STIMULATING DEVICE EMPLOYING VARIABLE FREQUENCY INTERRUPTED LIGHT SOURCE AND COLOR FILTERS

John C. Downing, 156 Bahama Reef, Novato, Calif. 94949

Continuation of Ser. No. 61,891, Jun. 15, 1987, abandoned. This application Oct. 4, 1988, Ser. No. 253,900

Int. Cl.[5] A61B *3/00*

U.S. Cl. 351—203 25 Claims



1. A device for producing a therapeutic stimulus in a subject, comprising:

a light source for shining light, at an effective level, into at least one eye of a subject,

a plurality of color filters, each of said filters being arranged to transmit light which is of a single color only and which is different from the light transmitted by all of the other filters of said plurality,

selection means for selectively interposing any one of said plurality of color filters between said light source and said eye of said subject,

interruption means, separate from and additonal to said selection means, for continuously interrupting said light source, while any selected one of said color filters is interposed between said light source and said eye of said subject, at a selectable rate which is lower than the critical flicker fusion frequency of said subject, such that said subject will see said light source as interrupted,

control means for increasing the frequency at which said interruption means interrupts said light source until said subject can see said light source change from interrupted to continuous, and

indicating means for indicating the rate at which said interruption means interrupts said light source.

4,940,324

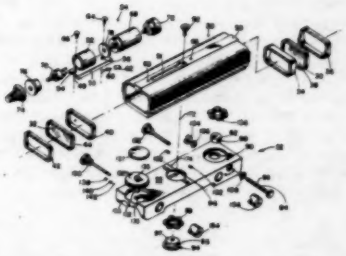
ELECTRONIC SIGHT HAVING A LARGER HORIZONTAL VIEWING FIELD THAN A VERTICAL VIEWING FIELD AND METHOD OF MAKING SAME

Joseph W. Nichols, Mehoopany, Pa., assignor to American Advantage Company, Portland, Oreg.

Filed May 25, 1988, Ser. No. 198,333

Int. Cl.[5] G02B *23/00, 23/10*

U.S. Cl. 356—247 39 Claims



1. An electronic sight for attaching to a shooting apparatus, comprising:

a base member to attach the sight to the shooting apparatus;

a longitudinally extending sight tube for viewing a target therethrough, said sight tube being pivotally coupled to said base for permitting said sight tube to pivot about two different axes independent of each other, said sight tube having a horizontal viewing field larger than a vertical viewing field;

a front lens connected to a front of said sight tube;

a back lens connected to a back of said sight tube; and

a light source positioned to be reflected from said front lens and through said back lens for viewing by a user.

4,940,325

DEVICE FOR THE INVESTIGATION OF HIGHLY RESOLVED PARTIAL SPECTRA OF AN ECHELLE SPECTRUM

Helmut Becker-Ross; Stefan Florek; Reinhard Tischendorf, all of Berlin; Klaus-Eberhard Engel, Frankfurt an der Oder; Wolf-Ekkehard Matzke, Fürstenwalde, and Susanne Engel, Frankfurt an der Oder, all of German Democratic Rep., assignors to Akademie der Wissenschaften der DDR, Berlin, German Democratic Rep.

Filed Mar. 8, 1989, Ser. No. 320,674

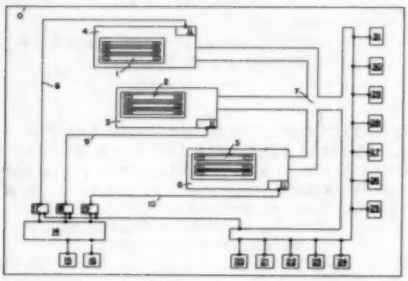
Claims priority, application German Democratic Rep., Mar. 11, 1988, 313622

Int. Cl.[5] G01J *3/18, 3/36*

U.S. Cl. 356—328 5 Claims

1. Device for the investigation of highly resolved partial

spectra from an échelle grating, comprising a position-resolving photoelectric detector including a plurality of photosensors arranged on an IC chip at positions of preselected spectral lines, each of said photosensors comprising (i) a CCD sensor row having sensor elements, a sensor storage device, and a transfer shift register, (ii) a logic circuit for enabling supply potentials and clock signals to be connected and output signals to be transferred to a common signal line, and (iii) an intermediate storage device disposed between said sensor storage device and said transfer shift register, a transfer gate disposed between said sensor storage device and said intermediate stor-



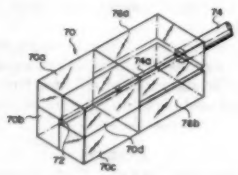
age device, and a digital logic circuit for enabling upon an external control signal the serial readout of the signals from a selectable subset of all CCD sensor rows in a selectable order of succession, wherein said transfer gates and said intermediate storage devices of each of said sensor rows are connected in parallel, the areas of the individual sensor elements of said CCD sensor rows are matched to the spectral elements of the échelle spectrum and extend successively in the direction of dispersion of the échelle grating, the total number of sensor elements in all CCD sensor rows being less than the number of spectral elements in the échelle spectrum.

4,940,326

PARTICLE SIZE MEASURING APPARATUS

Kyoichi Tatsuno, Yamato, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Continuation-in-part of Ser. No. 168,509, Mar. 15, 1988, abandoned. This application May 22, 1989, Ser. No. 355,827
Claims priority, application Japan, Mar. 28, 1987, 62-74847
Int. Cl.[5] G01N *15/02, 21/49*
U.S. Cl. 356—336 **22 Claims**



1. An apparatus for measuring a size of a practicle flowing through a measuring volume, comprising:

light source means for emitting a light;

irradiating means, provided between said light source means and the measuring volume, for converting the light emitted from said light source means to a light having a uniform intensity distribution and for irradiating a converted light to the measuring volume, said irradiating means comprising an optical fiber for leading the light emitted from said light source means to the measuring volume, a waveguide member connected to a front end of said optical fiber for transmitting the light emitted from said optical fiber by way of total reflection from the walls thereof, and support means for fixedly supporting a front portion of the optical fiber to align the optical fiber and the waveguide member in a coaxial manner;

light-receiving means for receiving a light irradiated from said irradiating means and scattered to a predetermined angle by the particle and for producing a scattered light pulse for each particle; and

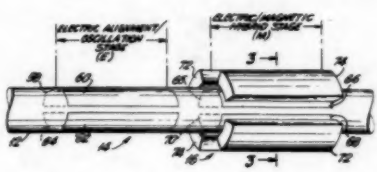
means for obtaining the size of the particle based on a scattered light pulse height.

4,940,327

METHOD AND APPARATUS FOR REAL TIME ASBESTOS AEROSOL MONITORING

Pedro Lilienfeld, Lexington, Mass., assignor to TRC Companies Inc., East Hartford, Conn.

Filed Oct. 25, 1988, Ser. No. 262,457
Int. Cl.[5] G01N *21/53*
U.S. Cl. 356—338 **34 Claims**



1. A real time asbestos aerosol monitor comprising:

sampling means for obtaining an ambient air sample and providing said sample to a sensing chamber having a sensing zone;

magnetic field means for creating a time-varying magnetic field at said sensing zone in order to cause airborne asbestos fibers in said sample to rotate;

illumination means for illuminating said fibers; and

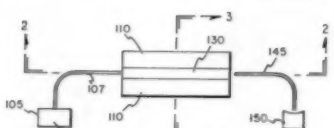
a detector for detecting light scattered by said fibers to produce a scattered light signal indicative of the presence of an asbestos fiber.

4,940,328

OPTICAL SENSING APPARATUS AND METHOD

Nile F. Hartman, Stone Mountain, Ga., assignor to Georgia Tech Research Corporation, Atlanta, Ga.

Filed Nov. 4, 1988, Ser. No. 267,212
Int. Cl.[5] G01B *9/02*
U.S. Cl. 356—345 **19 Claims**



1. A method for sensing a property of an environment, comprising the steps of:

providing, in said environment, an optical waveguide layer between substrate and superstrate layers, said optical waveguide layer having a higher refractive index than the refractive indices of said substrate and superstrate;

injecting a light beam into said waveguide such that at least two modes of said beam propagate in said waveguide, the effective index of refraction for said modes of said beam being affected by said property; and

generating an electrical signal representative of the interfer-

ing product of said at least two modes of said beam which have propagated through said waveguide;

said signal being indicative of said property of the evironment.

4,940,329

DEGASSING EXTRUDER

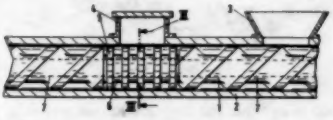
Manfred Dienst, Burgdorf, Fed. Rep. of Germany, assignor to Hermann Berstorff Maschinenbau GmbH, Hanover, Fed. Rep. of Germany

Filed Dec. 8, 1989, Ser. No. 447,915

Claims priority, application Fed. Rep. of Germany, Dec. 10, 1988, 3841729

Int. Cl.[5] B29B *1/10*

U.S. Cl. 366—75 **7 Claims**



1. An extruder for degassing viscous thermoplastic plastics materials in the form of a melt comprising a barrel; at least one screw mounted for rotation with said barrel, shaft means mounting said at least one screw, said screw comprising core means mounted on said shaft and flight means helically disposed about the periphery of said core means, said barrel having a wall surface, said wall surface defining a first throughbore for the introduction of said plastics material into said barrel and a second throughbore downstream of said first throughbore for degassing said plastics material within said barrel, an intake and metering zone defined within said barrel between said first and said second throughbores and means for degassing said thermoplastic material communicating with the interior of said barrel through said second throughbore wherein said flight of each said screw is discontinuous in the region of said second throughbore; a plurality of disc members and spacer discs are alternately mounted on each said screw shaft in said region of said second throughbore, each said disc member and spacer disc having first and second opposed major surfaces, said first major surface being downstream of said second major surface, said first major surface of each said disc member defining profile means enhancing conveyance of said material in said downstream direction, each said disc member having a major dimension substantially equal to the overall diameter of said screw in said flighted region and each said spacer member having a major dimension substantially equal to the diameter of said screw core and wherein the thickness of each said disc member and spacer disc measured from said first major surface to said second major surface lies in the range of from 0.1 to 0.5 times said screw diameter.

4,940,330

LASER DOPPLER ANEMOMETER

Dietrich Dopheide; Michael Faber; Guenter Taux, all of Braunschweig, and Gerhard Reim, Rothemuehle, all of Fed. Rep. of Germany, assignors to Fed. Rep. of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute, Braunsweig, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,925

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1987, 3725978; Oct. 30, 1987, 3736772

Int. Cl.[5] G01P *3/36*

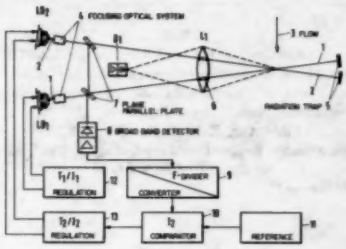
U.S. Cl. 356—28.5 **5 Claims**

1. A laser Doppler anemometer comprising:

at least a first and second laser source, each said source including a laser diode set to a different emission wavelength, for producing first and second laser beams, respectively;

means for directing said laser beams from said sources to a specific region of a flowing fluid containing particles, so that a virtual interference fringe pattern is formed in said region;

at least one photodetector positioned for receiving light scattered by said flowing fluid;



at least one of a temperature regulation and a current regulation circuit for stabilizing the wavelength of at least one of said laser beams from at least one of said first and second sources; and

regulation circuit means for maintaining constant the difference frequency between said first and second laser sources, said difference frequency controlling said at least one of said temperature regulation or said current regulation circuit, said regulation circuit means including a measuring photodetector.

4,940,331

HETERODYNE LASER INSTANTANEOUS FREQUENCY MEASUREMENT SYSTEM

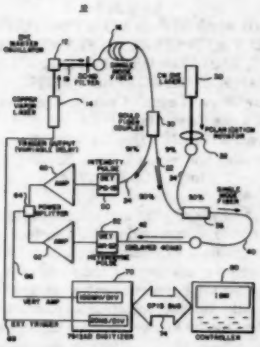
Richard W. Wyeth, Livermore; Michael A. Johnson, Pleasanton, and Michael A. Globig, Livermore, all of Calif., assignors to The United States of America as represented by the United States Department of Energy, Washington, D.C.

Continuation of Ser. No. 911,023, Sep. 24, 1986, Pat. No. 4,798,467. This application Sep. 27, 1988, Ser. No. 249,816

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] G01B *9/02*

U.S. Cl. 356—349 **7 Claims**



1. A laser beam frequency diagnostic system comprising

a first pulsed laser for generating a first short time duration pulsed laser beam having a pulse length duration of ap-

proximately 10–100 nanoseconds, the instantaneous frequency of which is to be determined,

a second reference laser for generating a second laser beam having a predetermined frequency,

means for heterodyning said first and second laser beams to form a beat signal representative of the difference between said first and second frequencies, and

means for processing said beat signal with respect to time to determine the instantaneous frequency of said first laser beam.

4,940,332

FLUORESCENT ANALYSIS APPARATUS

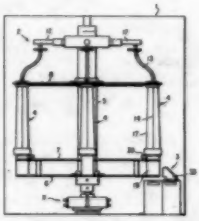
Harufumi Miwa, Kawasaki; Minoru Kashiwada, and Yoshimasa Yahagi, both of Kawaguchi, all of Japan, assignors to Ajinomoto Co., Inc., Tokyo, Japan

Filed Aug. 5, 1988, Ser. No. 228,588

Claims priority, application Japan, Aug. 5, 1987, 62-194314

Int. Cl.[5] G01N *21/64*

U.S. Cl. 356—417 **9 Claims**



1. A fluorescent analysis apparatus comprising:

a thermostatically controlled enclosure;

a reacting board contained within said enclosure, including a reacting section and a measuring section;

a plurality of containers arranged on said reacting board for receiving samples, each container having an upper part, a lower part and a filter therebetween; and

a measuring apparatus contained within the enclosure and next to the measuring section of the reacting board;

wherein a reaction involving a sample may be made in the reaction section of the reacting board and then moved to the measuring section so that a measurement may be made by the measurement apparatus without removing the sample from the enclosure.

4,940,333

METHOD AND APPARATUS FOR DETECTING UNIVERSALLY AND SELECTIVELY CONCENTRATION GRADIENTS, AND FOR DEFLECTING A LIGHT BEAM IN A CONTROLLED FASHION

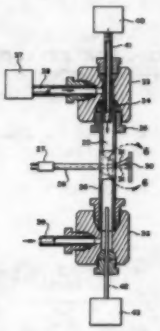
Janusz B. Pawliszyn, Logan, Utah, assignor to Anthony R. Torres, Salt Lake City, Utah

Division of Ser. No. 948,247, Dec. 31, 1986, Pat. No. 4,784,494. This application Nov. 14, 1988, Ser. No. 271,034

Int. Cl.[5] G01N *21/41*

U.S. Cl. 356—432 **15 Claims**

1. A method of identifying and measuring a concentration gradient of a known compound above a surface which forms a concentration gradient extending in a concentration gradient direction thereabove, comprising the steps of passing a probe beam of light through the concentration gradient a known distance above the surface; selecting an excitation energy that will be absorbed by the known compound; supplying the excitation energy substantially uniformly in the concentration gradient direction through at least the portion of the area above the surface through which the probe beam passes so that the excitation energy will be absorbed by the known compound in the concentration gradient thereby causing the creation of a temperature gradient above the surface which is proportional to the concentration gradient of the known compound above the surface; and measuring the deflection of the



probe beam of light passing through the concentration gradient and temperature gradient above the surface caused by the presence of the concentration gradient and temperature gradient above the surface.

4,940,334

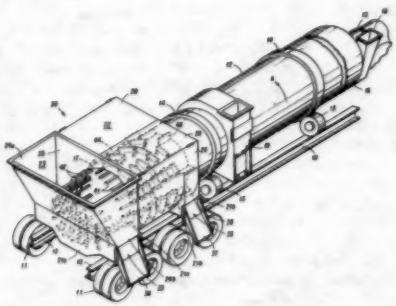
REVERSE FLOW MIXING METHOD FOR DIRECT-FIRED ASPHALTIC CONCRETE DRUM MIXERS

Joseph E. Musil, Ely, Iowa, assignor to Cedarapids, Inc., Cedar Rapids, Iowa

Division of Ser. No. 089,179, Aug. 25, 1987, Pat. No. 4,813,784. This application Dec. 19, 1988, Ser. No. 286,218

Int. Cl.[5] B28C *5/20, 5/46, 7/12, 7/16*

U.S. Cl. 366—4 **7 Claims**



3. In a method of heating material in a mixer with a stream of air and hot gases within a drum while moving the material from an upstream end of the drum to a downstream end of the drum, including feeding the material into the drum at the upstream end thereof, combining and mixing the material with liquid asphalt, and discharging the mixed material and asphalt through a discharge chute, the improvement comprising:

selectively directing the asphalt to being combined with the material either within the drum intermediate the upstream and downstream ends in the presence of the air and hot gases, or to being combined with the material, after discharging the material from the drum at the downstream end thereof, at a first end of a passage extending externally of and adjacent the drum from adjacent the downstream end of the drum along the drum toward the upstream end of the drum with a second end of the passage disposed

along the drum intermediate the upstream and downstream ends thereof;

selectively discharging the material from the mixer through a first discharge port and chute at the first end of the passage adjacent the downstream end of the drum by maintaining open the first discharge port and chute, or discharging the material at a second discharge port and chute at the second end of the passage by closing off the first discharge port and moving the material through the passage to the second discharge port and chute; and

directing the asphalt to being combined with the material after discharging the material from the drum at the downstream end thereof only in combination with discharging the material from the mixer at the second discharge port and chute at the second end of the passage.

4,940,335

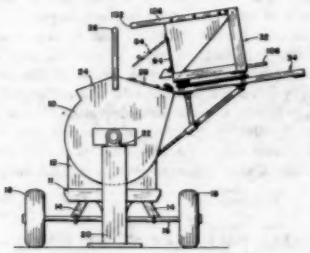
METHOD AND APPARATUS FOR ADDING PREDETERMINED QUANTITY OF MATERIAL TO A REACTOR

Adler E. Gibson, P.O. Box 35587, Tulsa, Okla. 74153

Filed Nov. 21, 1988, Ser. No. 273,999

Int. Cl.[5] B28C *7/06, 7/16*

U.S. Cl. 366—8 **8 Claims**



1. A method of adding a predetermined volume of particulate material to a reactor which comprises mounting an inclined track on the reactor such that a lower end of the track terminates adjacent an opening in the reactor, mounting a slideable container on the track for sliding movement from an upper end of the track to the lower end of the track, the container having an internal volume equal to said predetermined volume, and having a forward wall which can be opened to discharge the contents of the container, filling the container with particulate material when the container is adjacent the upper end of the track, allowing the container to side downwardly along the track until the container is adjacent the opening in the reactor, opening the forward wall of the container to allow particulate material to flow into the opening of the reactor and thereafter tilting the container towards the reactor to discharge any remaining particulate material in the container into the reactor.

4,940,336

UNBALANCE VIBRATOR

Alexandr I. Dryga, ulitsa Marata, 6, kv. 64, and Alexandr G. Eskov, ulitsa Katerinicha, i6, kv. 42, both of Kramatorsk, U.S.S.R.

Filed May 30, 1989, Ser. No. 357,945

Int. Cl.[5] B01F *11/00*; F16H *33/00*

U.S. Cl. 366—128 **10 Claims**

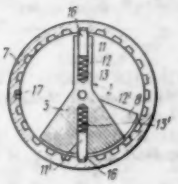
1. An unbalance vibrator comprising: a rotary drive shaft;

an unbalance weight fixed stationary and another unbalance weight turnable with respect to said rotatable drive shaft;

one of said unbalance weights being made, at least in part, in the form of a cylindrical sleeve having radial holes provided on an inside cylindrical surface of the sleeve;

the other of said unbalance weights being made in the form of at least a part of a cylinder arranged within said sleeve; and

a mechanism for adjusting the mutual positions of said unbalance weights and made in the form of a rod spring-loaded in an axial direction and mounted on said turnable unbalance weight so as to move radially to engage in one of said radial holes provided in said sleeve.



4,940,337

APPARATUS FOR SEPARATING HEAVY METALS FROM A FERRIC CHLORIDE WASTE FLUID

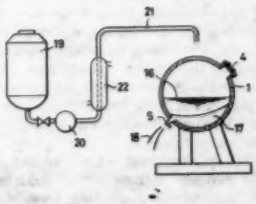
Nobuo Nakaji; Hideki Kojima, both of Tokyo, and Ryoichi Tachibana, Akou, all of Japan, assignors to Toppan Printing Co., Ltd.; Mitsubishi Rayon Engineering Co., Ltd. and Harima Chemial Industrial Co., Ltd., all of, Japan

Continuation of Ser. No. 64,194, Jun. 18, 1987, abandoned. This application Sep. 5, 1989, Ser. No. 403,796

Claims priority, application Japan, Jun. 23, 1986, 61-146471

Int. Cl.[5] B01F *15/06, 9/02*; B01J *8/10*

U.S. Cl. 366—148 **14 Claims**



1. Apparatus for separating heavy metals from a ferric chloride waste fluid containing said heavy metals and metallic iron masses, wherein said heavy metals include iron and a substantial portion of nickel, said nickel having a tendency to adhere to the surface of said metallic iron masses, said apparatus comprising a sealable container having a predetermined axis of rotation, said sealable container including a sealable entrance port for said ferric chloride waste fluid and said metallic iron masses and at least one exit port for withdrawing said separated heavy metals and treated ferric chloride waste fluid therefrom, feed pipe means for supplying said ferric chloride waste fluid to said entrance port of said sealable container, preliminary heating means for heating said ferric chloride waste fluid in said feed pipe means prior to supplying said ferric chloride waste fluid to said entrance port of said sealable container, rotating means for rotating said sealable container about said predetermined axis of rotation with sufficient intensity to substantially prevent said nickel from adhering to the surface of said metallic iron masses, and stopping means for stopping said rotating of said sealable container at a predetermined rotational angle.

11. A method for separating heavy metals from a ferric chloride waste fluid containing heavy metals, wherein said heavy metals include iron and a substantial portion of nickel, said method comprising heating said ferric chloride waste fluid, supplying said heated ferric chloride waste fluid to a sealable container having a predetermined axis of rotation,

adding metallic iron masses to said sealable container, sealing said sealable container, rotating said sealable container about said predetermined axis of rotation with sufficient intensity to substantially prevent said nickel from adhering to the surface of said metallic iron masses, and stopping said sealable container at predetermined rotational angles.

4,948,338

DEVICE FOR THE MIXING OF COMPOST

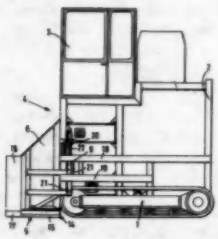
Friedrich Backhus, Wischenstrasse 23, 2908 Edewecht Jeddeloh II, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,538

Claims priority, application Fed. Rep. of Germany, May 28, 1988, 3P18206

Int. Cl.[5] B01F *15/00*

U.S. Cl. 366—345 **7 Claims**



1. A mobile device for turning over or mixing accumulations of organic waste materials maturing to compost at fixed dump sites, said device having a steerable chassis with working tracks enabling it to advance through the accumulation, and having a mechanism for mixing the waste picked up while driving through and, after being thoroughly mixed, re-depositing the waste behind the device, comprising:

a clearing mechanism disposed on the front side of the chassis and in the area in front of each working track of the chassis for clearing a track path as the chassis moves through the waste material;

said clearing mechanism comprising a mixing mechanism, a guide shield disposed in front of the intake of said mixing mechanism, and working clearing tools disposed on a guide surface within said mixing mechanism;

each clearing tool comprising a disk, and a drive element containing said disk for rotating the disks in front of the guide surface, and excavating projections being provided on said disks;

each disk projection comprising a strip extending radially from said disk and projecting out of the plane of said disk;

a hydraulic motor coupled to said drive element of each clearing tool for rotating said disks; and

a scraper strip disposed on the lower edge of each guide surface.

4,948,339

ENDLESS RECTILINEAR MOTION ROLLING GUIDE UNIT

Juichi Amano, Yokohama, Japan, assignor to Nippon Thompson Co., Ltd., Tokyo, Japan

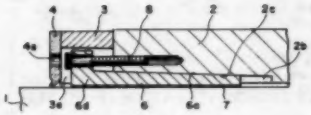
Filed Apr. 21, 1988, Ser. No. 184,384

Claims priority, application Japan, Dec. 22, 1987, 62-194729[U]

Int. Cl.[5] F16C *29/06*

U.S. Cl. 384—25 **2 Claims**

1. A rectilinear motion rolling guide unit comprising an elongated track rail having, on each of its sidewalls, longitudinally extending trackway means, a slide unit having a recess with an inverted U-shaped cross section in which the upper portion of said track rail is slidably inserted, on each of the inner sidewall surfaces of said recess being formed trackway means in facing relation with the above-mentioned track-rail side trackway means, and a plurality of cylindrical rollers present between the facing track-rail side and slide-unit side trackway means, which guide unit is characterized in that said slide unit includes a casing and opposing side panels fitted onto the opposing open ends of said casing with the inner sidewalls thereof being provided with the above-mentioned slide unit-side trackway means, while on the bottom surface of said casing forming a horizontal surface of said recess of the slide unit is provided a generally rectangular-shaped recess with an inwardly and gradually decreasing depth along the sliding



direction of the slide unit relative to said track rail, a slide bearing holder insert having a L-shaped cross section is inserted and secured within said generally rectangular-shaped recess of the slide unit, said insert consisting of an upright flange portion at one end and a portion having a gradually decreasing height toward the other end so as to snugly conform to the above-mentioned recess of the slide unit having an inwardly and gradually decreasing depth so that said insert may be snugly fitted and secured into said rectangular-shaped recess of slide unit in a position displaceable relation with said recess along the sliding direction of said slide unit relative to said track rail, and a slide friction member is provided on the bottom surface of said L-shaped slide bearing holder insert.

4,948,340

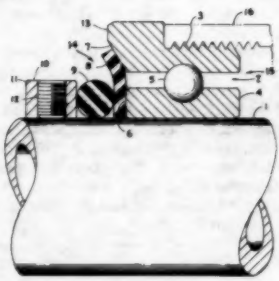
SEALED BALL BEARING MECHANISM

Roger O. Durham, 1370 Thompson Ave., Glendale, Calif. 91201

Filed Jan. 10, 1990, Ser. No. 462,762

Int. Cl.[5] F16C *33/78*

U.S. Cl. 384—482 **3 Claims**



1. A bearing seal device for a ball bearing mechanism, said ball bearing mechanism including; an outer race formed for engagement with a housing, said outer race having a seal-end face and a sealing surface adjoining said seal-end face, an inner race formed for engagement with a cylindrical shaft, said inner race having a seal-end face which is inset from said seal-end face of said outer race, and a plurality of balls, said bearing seal device comprising;

(a) a flexible sealing ring abutting said seal-end face of said inner race and bearing against said sealing surface of said outer race;

(b) an elastic circumferential seal formed for engagement

with, and for forming a seal with, said cylindrical shaft, and forming a seal with said elastic sealing ring;

(c) bias means for engagement with said cylindrical shaft, said bias means adapted for pressing against said circumferential seal, whereby said sealing ring is deformed into a cup shape by contact with said sealing surface of said outer race.

4,940,341

OIL-METERING COVER FOR SHAFT BEARINGS

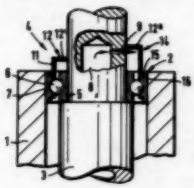
Guenter Schuetz, and Joerg Schwartz, both of Cologne, Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Fed. Rep. of Germany

Filed Aug. 11, 1989, Ser. No. 393,304

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1988, 8810291[U]

Int. Cl.[5] F16C *33/66, 37/00;* F01M *9/12*

U.S. Cl. 384—465 **6 Claims**



1. In a device having a shaft comprising a central channel for supplying a shaft bearing with oil, said channel further comprising an oil exit opening disposed adjacent said shaft bearing, wherein said device is provided with a covering surrounding said shaft and comprising the following:

a cylindrical section having an inwardly directed edge that surrounds the shaft in noncontacting fashion and covers an annular gap between a stationary bearing ring and a rotating bearing ring;

wherein said cylindrical section has an increased height over a part of its circumference; and

wherein said oil exit opening is situated between a lower part and an upper part of the inwardly directed edge of the covering.

4,940,342

COMPRESSOR WITH A RADIAL BEARING FOR SUPPORTING A DRIVE SHAFT

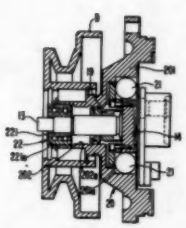
Kiyoshi Miyazawa, Annaka, and Shigemi Shimizu, Sakai, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Jun. 16, 1988, Ser. No. 207,219

Claims priority, application Japan, Jun. 16, 1987, 62-91333[U]

Int. Cl.[5] F16C *33/58;* B25B *27/06;* F01C *1/00;* F04B *1/12*

U.S. Cl. 384—510 **15 Claims**



1. In a compressor including a housing comprising a first casing for enclosing a compression mechanism and a second casing releasably attached to one end of said first casing, said second casing supporting a pair of bearings which rotatably support a drive shaft, a first one of said bearings being adjacent said first casing and the second bearing being spaced therefrom toward the driven end of said drive shaft, sealing means disposed about said drive shaft and between said bearings for sealing said housing and preventing refrigerant or lubricating oil from leaking therefrom, the improvement comprising:

said second bearing having gripping means for gripping said second bearing when removing said second bearing from said drive shaft so that said sealing means may be replaced without separating said first and second casings, wherein said gripping means is formed by a deviation in the outermost radial surface of said second bearing.

4,940,343

WIRE-DOT PRINT HEAD DRIVING APPARATUS

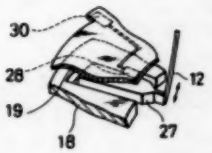
Hiroshi Kikuchi; Jiro Tanuma; Hideaki Ishimizu, and Chihiro Komori, all of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Continuation-in-part of Ser. No. 235,971, Sep. 24, 1988, abandoned. This application Aug. 17, 1989, Ser. No. 395,159

Claims priority, application Japan, Aug. 26, 1987, 62-210138; Aug. 26, 1987, 62-210139; Oct. 19, 1987, 62-158792[U]

Int. Cl.[5] B41J *3/12*

U.S. Cl. 400—124 **13 Claims**



1. A printer having a wire-dot print head comprising:

print wires extending forward generally parallel with each other,

armatures in association with the respective print wires, a rear end of each print wire being fixed to the associated armature,

a substantially disk-shaped rear yoke,

cores mounted at their rear ends on said rear yoke in association with the respective armatures, each cores having its forward end adjacent to rear surface of the associated armature,

coils in association with the respective cores, each coil being wound on the associated core,

a cylindrical wall surrounding said armatures, said cores and said coils,

an annular permanent magnet forming part of said cylindrical wall,

resilient support members in association with the respective armatures, each resilient support member having a firs end fixed at said cylindrical wall and a second end fixed to the associated armature,

a front yoke having an annular part forming part of said cylindrical wall and protrusions extending from said annular part radially inward, each protrusion being positioned on a side of one of said armatures, and

magnetic path means for allowing a magetic flux from said permanent magnet to pass through said core, said armature and said front yoke,

wherein when each of the coils is not energized the associated armature is attracted toward the associated core to resiliently deform the associated resilient support member, and

when each of the coils is energized and associated armature is released and moved forward by the action of the associated resilient support member,

said print head further comprising a sensor card having a

disk-shaped part positioned in front of the front yoke, and having a rear surface on which the fixed, individual electrodes are formed to face the armatures and on which a common electrode conductor is contact with the front yoke is formed, and

wherein each of said individual electrodes and the confronting armature form a capacitive sensor the capacitance of which varies with the motion of the associated print wire, and the armatures are connected to the common electrode conductor.

4,940,344

PRINTER HAVING A VARIABLE INTERVAL BETWEEN PRINTING AND CARRIAGE MOVEMENT

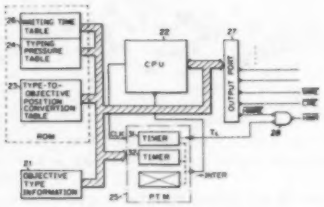
Toshihide Wada, Yokohama, and Yuichi Watanabe, Kawasaki, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 51,177, May 18, 1987, abandoned, and a continuation of Ser. No. 754,439, Jul. 12, 1985, abandoned. This application Jan. 31, 1989, Ser. No. 303,953

Claims priority, application Japan, Jul. 30, 1984, 59-159915; Jul. 31, 1984, 59-160334

Int. Cl.[5] B41J *1/22*

U.S. Cl. 400—144.2 **6 Claims**



1. A printer comprising:

type supporting means for supporting a plurality of types;

type selection means for making said type supporting means operative to lead the type selected from among said plurality of types to a printing position;

a striking apparatus having a hammer for striking a type on a recording paper;

a carriage for mounting said type supporting member, said type selection means and said striking apparatus;

carriage moving means for moving said carriage between the printing positions and for providing a stop state at each one of the printing positions;

driving time means for supplying a driving time signal to said striking apparatus to make said hammer strike a type on a recording paper at a stop state of said carriage;

first timer means for counting, after said carriage is in the stop state, a length of time from a supply of a drive signal for hammer striking until a completion of striking of said type by a head of said hammer, said length of time being predetermined;

second time means for starting counting simultaneously with said counting by said first timer means to count a time until said carriage is to start moving after being in the stop state; and

means for supplying, when a counting operation of said first timer means is completed, a carriage moving signal to said carriage moving means, the start time of the carriage moving signal being changed in accordance with an amount of a counted value of said second timer means.

4,940,345

INK CASSETTE AND INK TRANSFER ROLL THEREFOF

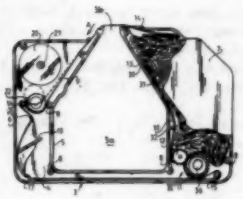
Hans Raar, An Cuyk, Netherlands, assignor to Merlin C.T.C. Production Division Nederland B.V., Netherlands

Filed Oct. 28, 1988, Ser. No. 263,878

Claims priority, application Netherlands, Oct. 28, 1987, 8702567

Int. Cl.[5] B41J *33/10*

U.S. Cl. 400—195 **4 Claims**



1. A long-lasting cassette for use in a printing unit, said cassette comprising:

a housing which includes outer walls and inner walls, said walls forming an internal chamber having an externally-exposed opening and, together with the outer walls, forming infeed and storage compartments on opposite sides of the internal chamber which respectively have mouths adjacent to externally exposed opening,

a rotatable ink roll located in the infeed compartment,

a rotatable intermediate roll located in the infeed compartment and mounted to be movable towards any away from the rotatable ink roll,

a first guide roll located in the infeed compartment,

a partition member located in the infeed compartment,

a pair of rotatable drive wheels located in the storage compartment, a first drive wheel of the pair of drive wheels being movable towards and away from the second drive wheel of the pair of drive wheels,

an elongated spring means which contacts the first drive wheel to urge it towards the second drive wheel and define a nip therebetween,

a second guide roll located in the storage compartment,

an endless mobius ribbon which sequentially extends out of the mouth of the storage compartment and across the externally-exposed opening, through the mouth of the infeed compartment and into the infeed compartment, around a portion of the periphery of the intermediate roll, around the first guide roll, over the partition member so as to be reversed in orientation, around the second guide roll so as to be reversed in direction, around a portion of the periphery of the second drive wheel and through the nip between the first drive wheel and the second drive wheel, and after forming an accumulation in the storage compartment, out of the mouth of the storage compartment, and

engagement means for contacting the mobius ribbon to provide tension therein when moved by the pair of drive wheels out of the mouth of the storage compartment, movement of the tensioned mobius ribbon over the intermediate roll and around the first guide roll causing the intermediate roll to contact the ink roll so that the intermediate roll can transfer ink from the ink roll to the mobius ribbon.

4,940,346

KEYBOARD ASSEMBLY AND TYPING METHOD

Don C. Liljenquist, 8360 Greensboro Dr., McLean, Va. 22102

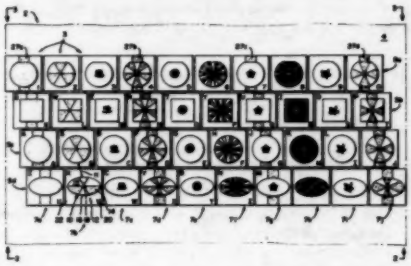
Filed Apr. 1, 1987, Ser. No. 32,622

Int. Cl.[5] B41J *5/10*

U.S. Cl. 400—487 **21 Claims**

1. An improved keyboard assembly for use with a device for

processing alphabetical or numerical information, cmoprising a plurality of keys arranged in a plurality of mutually adjacent rows and columns, wherein each key corresponds to a selected alphanumeric symbol, and is substantially covered by a visual pattern formed from a combination of one of a plurality of color pattern schemes and one of a plurality of shapes wherein the combination of the color scheme and shape forming the visual pattern of each key is different from the combination of color scheme and shape forming the visual pattern on each



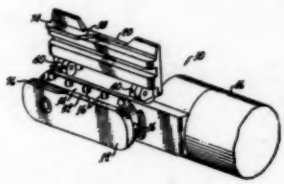
adjacent key in order to facilitate visual discrimination between said keys, and wherein the shapes of the color schemes of the visual patterns are the same for each key in any given row in the same rows, but different than keys in no row or rows adjacent to said given row in order to assist a keyboard operator with proper manual orientation with respect to the keyboard while at the same time rendering adjacent keys different in the peripheral and near-focus vision of said keyboard operator.

4,940,347

PAPER TRACTOR FEED SEPARATOR

William J. Lund, Stockton, Calif., assignor to Lund Company, Stockton, Calif.

Filed Feb. 16, 1988, Ser. No. 156,207
Int. Cl.[5] B41J *11/68*
U.S. Cl. 400—621.1 **17 Claims**



1. A paper tractor feed separator for automatically separating paper-drive edge tear strips from a paper form along perforations therein, said paper tractor feed separator comprising:

a frame;

a belt for moving drive pins along the frame, said drive pins being sized to engage punched holes in said edge tear strips;

frame shoulder means for guiding said edge tear strip to enable a body portion of the paper form to be urged out of the plane of the edge tear strip along the perforations in order to separate the body portion from the edge tear strip; and,

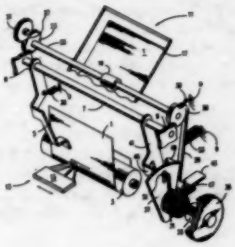
lid means for keeping the drive pins engaged with the punched holes, said lid means including lid shoulder means for urging the body portion out of the plane of the edge tear strip to separate the body portion from the edge tear strip.

4,940,348

PLATEN CONTROLLED SHEETFEED PERMITTING BACK-UP FOR ERASURE

Albert L. Akers, Nicholasville; Robert M. Carpenter, Lexington; William D. Freeman, Harrodsburg, and John E. Passeflume, Lexington, all of Ky., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 15, 1988, Ser. No. 244,366
Int. Cl.[5] B41J *13/10*
U.S. Cl. 400—624 **3 Claims**



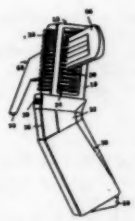
1. A printer having a printing region and means to position paper for receiving printing from said printer at said printing region, a first abutment, means for sensing the presence of paper in said printing region, means biasing said means for sensing for movement, which movement is prevented by the presence of paper being sensed, means responsive to said means for sensing to move said first abutment when paper is sensed by said means for sensing, a sheetfeed for supplying paper to said printing region, means responsive to movement of said means to position paper to initiate operation of said sheetfeed by a movement of said means to position paper to feed paper from bottom-to-top, and means to disable said sheetfeed from supplying paper, said sheetfeed comprising a spring clutch and said means to disable comprising said first abutment engaging said spring clutch to unwind said spring clutch positioned for said unwinding by said movement of said first abutment in response to said means to sensing.

4,940,349

GOLF CLUB CLEANER

Johannes C. Jansen van Rensburg, 16 Marlon Pl., Glendower, Johannesburg, South Africa 1610

Continuation of Ser. No. 68,622, Jul. 1, 1987, abandoned. This application May 30, 1989, Ser. No. 358,489
Claims priority, application South Africa, Jul. 1, 1986, 86/4868
Int. Cl.[5] A46B *11/02*
U.S. Cl. 401—10 **7 Claims**



1. A portable, manually manipulatable grippable golf club blade cleaner comprising:

a member of generally rectangular section having longer end surfaces and shorter side faces, said member being formed

into an open generally rectangular ring which has a pair of parallel longer sides respectively with inner surfaces that face another, said end surfaces constituting respectively said inner surfaces as well as outer surfaces of the ring,

internal bristles formed on at least one of said inner surfaces but not the said side faces and having free ends which terminate along a given plane for cleaning said golf club blade when inserted between said inner surfaces,

a handle which is inclined relative to said plane and which is of the same order of size as the ring for supporting the latter, and

a cleaning fluid chamber and pump means both incorporated in said handle for pumping cleaning fluid from said chamber onto said club blade,

the arrangement being such that, with the blade of the club head in the ring, relative reciprocation between the ring and the club head, the latter will be cleaned by the bristles.

4,940,350

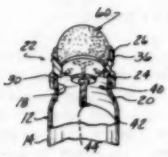
FLUID BALL APPLICATOR WITH VENT TUBE

Yong I. Kim, 3043 Wolverine Dr., Ann Arbor, Mich. 48108

Filed Dec. 30, 1988, Ser. No. 292,323

Int. Cl.[5] B43K *7/10*; A45D *34/04*

U.S. Cl. 401—209 **15 Claims**



1. A fluid applicator comprising:

a hollow container for containing a fluid, the container having an open top end;

a collar mounted on the open top end of the container, the collar having first and second ends;

a base mounted within the collar and extending across the first end of the collar;

an applicator member rotatably mounted in the collar and extending partially outward from the second end of the collar, the applicator member being formed of a porous material having open ended pores formed on the exterior surface thereof;

fluid dispensing outlets formed in the base in fluid flow communication with the interior of the container to dispense fluid from the container to the applicator member; and

a hollow air intake conduit having a first end formed in the base and disposed in fluid flow communication with the pores in the applicator member and a second end disposed within and in fluid flow communication with the interior of the container;

the diameter of the fluid outlets having a predetermined size relative to the diameter of the air intake conduit which causes the amount of fluid dispensed through the fluid outlets to be substantially equal to the amount of air drawn into the air intake conduit.

4,940,351

LIQUID APPLICATOR WITH MOVABLE SUPPLY TUBE

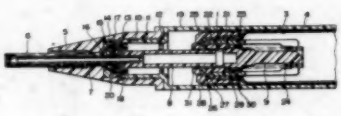
Yoshiomi Konose, Fujioka, Japan, assignor to Mitsubishi Pencil Co., Ltd., Tokyo, Japan

Filed Jul. 18, 1989, Ser. No. 381,234

Int. Cl.[5] A45D *34/00*; A46B *11/00*

U.S. Cl. 401—278 **1 Claim**

1. In a liquid applicator comprising: an outer sleeve-like main body; a liquid-application member mounted on a front-end portion of said outer sleeve-like main body; an application-liquid reservoir cartridge axially slidably mounted in said outer sleeve-like main body, said cartridge being provided with a valve unit in its front-end opening portion, said valve unit being provided with a valve spring for resiliently pressing a valve stem against a valve seat; a means for axially pushing said cartridge forward, an application-liquid conduit for supplying an application liquid filled in said cartridge to said liquid-application member through said valve unit, said conduit being provided in front of said cartridge mounted in said outer sleeve-like main body, a rear end of which conduit abuts on said valve unit; and an application-liquid guide pipe integrally connected with said application-liquid conduit to communicate



therewith, a front-end portion of which guide pipe is inserted into said liquid-application member; whereby said cartridge is axially moved forward relative to said outer sleeve-like main body in use to open said valve unit so as to permit said application liquid to flow to said liquid-application member;

the improvement wherein:

said application-liquid conduit is axially movable by a predetermined distance together with said application-liquid guide pipe; and said liquid applicator further comprises a spring for resiliently pressing said application-liquid conduit against said valve stem of said valve unit, said spring being smaller in spring constant than said valve spring of the valve unit.

4,940,352

BINDING FOLDER

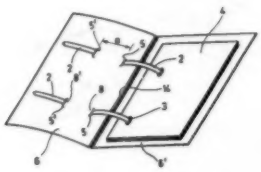
Herbert Kratzert, Pfullendorf-Denkingen, and Kurt Schrem, Pfullendorf, both of Fed. Rep. of Germany, assignors to Kratzert & Schrem GmbH, Fed. Rep. of Germany

Filed Mar. 8, 1989, Ser. No. 320,524

Claims priority, application Fed. Rep. of Germany, Mar. 12, 1988, 8803353[U]

Int. Cl.[5] B42F *13/10*

U.S. Cl. 402—13 **20 Claims**



1. A binding folder for holding paper sheets and the like having fastening strip means made of an elastically bendable material, which strip means are pulled through perforation means of the paper sheets to be held and extend in slot means of a counterholder, wherein the slot means in the counterholder include at least one pair of first and second counterholder slots closed on both sides and disposed at a predetermined distance (a) with respect to one another such that a fastening strip of the strip means is guided to be loosely movable through said first and second slots without being immovably clamped,

when the counterholder slots are formed by punched out tongues, and

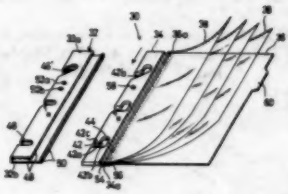
wherein the free end of the tongue of the first counterholder slot faces away from the free end of the tongue of the second counterholder slot.

4,940,353

HOLDER FOR PAPER-KEEPING BAGS

Katuo Osono, and Masaaki Maejima, both of Tokyo, Japan, assignors to King Jim Co., Ltd., Tokyo, Japan

Filed Jul. 25, 1988, Ser. No. 223,987
Claims priority, application Japan, Dec. 28, 1987, 62-330139
Int. Cl.[5] B42F *13/14*
U.S. Cl. 402—79 4 Claims



1. A holder of paper-keeping envelopes comprising an elastic sleeve (32) with U-shaped transverse section open along its one longitudinal side, a sliding bind base (34) inserted into the elastic sleeve (32) slidably in the longitudinal direction, a board (36) bonded at one side edge adhesive portions (34*a*) of the sliding bind base (34) and a plurality of paper-keeping envelopes (38) held in layers at one side edge holder portion (36*a*) of the board (36), wherein the sliding bind base (34) is provided at a predetermined distance apart from each other along its longitudinal direction with L-shaped guide grooves (42) and binding apertures (44) connected thereto for receiving posts of a binder, while the elastic sleeve (32) is provided with engagement grooves (46) for opening or closing the binding apertures (44) in transverse portions (42*a*) of the L-shaped guide grooves (42), said transverse portions (42*a*) and said engagement grooves (46) being so constructed that the trailing ones thereof when sliding the bind base (34) for closing the binding aperture of the sliding bind base (34) are slant grooves (42*a*', 46') open to the sliding direction and the forward ones thereof are transverse grooves (42*a*, 46) disposed at a substantially greater angle to the length of said sleeve (32) and bind base (34) than are said slant grooves (42*a*', 46').

4,940,354

MOUNTING DEVICE FOR MOUNTING A SQUEEGEE OR INKING BLADE IN A PRINTING PRESS

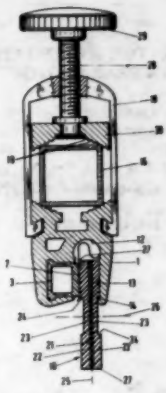
Jürg Holderegger, Im Altmoos, CH-8450, Datwil, and Dionizy Simson, Winterthur, both of Switzerland, assignors to Jürg Holderegger, Datwil, Switzerland

Filed Jun. 15, 1988, Ser. No. 207,165
Claims priority, application Switzerland, Jul. 6, 1987, 02559/87
Int. Cl.[5] F16B *17/00*; B41F *15/42*
U.S. Cl. 403—5 20 Claims

1. A mounting device for mounting one of a squeegee and an inking blade in a printing press, said device comprising

a hollow section member having a shaped internal recess on a longitudinal axis for receiving one of a squeegee and inking blade in a direction perpendicular to said longitudinal axis, a wall laterally bounding the recess and a longitudinal groove opposite said wall and in communication with said recess; and

a pressure-tight elastic clamping tube disposed in said groove and having a pressure retaining valve therein, said tube being expandable under a pressurized medium laterally into said recess to press the received one of said squeegee and inking blade laterally against said wall.

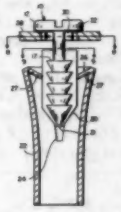


4,940,355

QUICK INSTALL AND RELEASE FASTENING SYSTEM

Jeffery J. Buchanan, Lexington, Ky., assignor to Square D Company, Palatine, Ill.

Filed Jul. 19, 1989, Ser. No. 384,605
Int. Cl.[5] F16B *21/07*
U.S. Cl. 403—24 4 Claims



1. In combination:

a cabinet having a plurality of integrally formed cylindrical receptacles each including a smooth bifurcated tapered entry section forming a pair of opposed spring latches;

a panel having a plurality of apertures in alignment with said receptacles;

a plurality of fastener means for securing said panel to said cabinet, each said fastener means comprising:

a drive head and a shank;

at least one radially extending frustum-shaped projection on said shank having a tapered portion and a flat portion;

a pair of ribs on opposite sides of said shank, said ribs forming two smooth surfaces extending outside the periphery of said frustum-shaped projection and terminating in a tapered end;

said tapered end and said smooth tapered entry cooperating to guide said shank into said receptacle, said tapered portion of said frustum-shaped projection readily displacing said spring latches during insertion of said fastener means and said flat portion of said frustum-shaped projection cooperating with said spring latches to secure said fastener means; and

said ribs displacing said spring latches to a position out of

engagement with said flat portion when said shank is rotated through substantially 90° to permit removal of said fastener means from said receptacle.

4,940,356

CONSTRUCTION FOR JOINING CHAINSTAY AND SEAT PIPES TO A REAR DROPOUT IN A BICYCLE FRAME

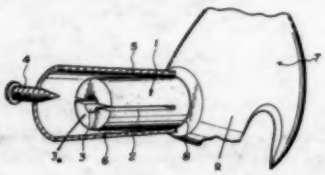
Masaki Hashimoto, Osaka, and Noboru Yamaguchi, Settsu, both of Japan, assignors to Araya Industrial Co., Ltd., Osaka, Japan

Filed Jul. 6, 1988, Ser. No. 215,558

Claims priority, application Japan, Nov. 11, 1987, 62-171429[U]

Int. Cl.[5] B62K *19/00*

U.S. Cl. 403—266 **3 Claims**



1. A construction joint of a bicycle frame comprising a rear dropout body having projecting portions cylindrical in shape, each said projecting portion defining an elongated screw hole at a free end extending along a longitudinal axis of said projecting portion, said projecting portion defining a slit extending on both sides of said screw hole; chainstay and seat stay pipes each having ends surrounding a projecting portion, said chainstay and seat stay pipes having gradually decreasing diameters towards their ends surrounding the projecting portions; a screw or wedge inserted into said screw hole to enlarge the outside circumference of said projecting portion until it frictionally contacts the interior of said chainstay and seat stay pipes, whereby the diameter of the projecting portion at said free end is greater than the diameter of the projecting portion at an end opposite said free end; and an adhesive agent spread around the projecting portions of the rear dropout body and inside said chainstay and seat stay pipes.

4,940,357

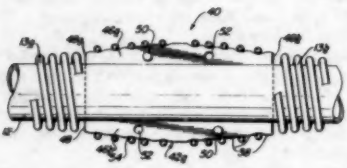
TORSION SPRING COUPLING

Albert W. Davis, 1714 S. Story Rd., Irving, Tex. 75060

Continuation-in-part of Ser. No. 99,108, Sep. 21, 1987, abandoned. This application Aug. 8, 1988, Ser. No. 229,442

Int. Cl.[5] B25G *3/00*

U.S. Cl. 403—344 **6 Claims**



2. A torsion spring coupling member comprising: at least two mating members having mating surfaces, an alignment pin on each mating surface, each mating surface having a depression for permitting longitudinal alignment of said mating members relative to each other to form a tubular coupling member having a central passage; tapered outer circumferential surfaces adjacent terminal ends of said coupling member, said outer circumferential surfaces having external threads for engaging opposing segments of a broken torsion spring to prevent relative longitudinal movement of opposing segments of the torsion spring.

4,940,358

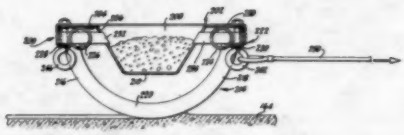
TEXTURING DEVICE FOR WET CONCRETE

Victor A. Maletic, 3330 Meadowbrook Rd., Antioch, Calif. 94509

Continuation-in-part of Ser. No. 128,909, Dec. 12, 1987, abandoned. This application Dec. 27, 1988, Ser. No. 290,026

Int. Cl.[5] E01C *19/43*

U.S. Cl. 404—93 **8 Claims**



1. A device for texturing the surface of freshly poured concrete used in conjunction with a kinetic source comprising:

a. a platform having a first surface and a second surface;

b. a plurality of open loops spaced along and extending outwardly from said platform first surface, each of said open loops having first and second ends, each of said open loops bearing on said platform and having a portion intermediate said first and second ends extending from said second surface of said platform, for contacting the freshly poured concrete beneath the platform, each of said plurality of open loops comprising a member possessing flexibility transversely relative to the freshly poured concrete; and

c. holding means for individually and resiliently detachably connecting each of said plurality of loops to said platform for movement therewith to permit the loops to drag across the freshly poured concrete, said holding means including a resilient member extending along said platform and each of said plurality of loops including means for engaging said resilient members at a plurality of selected positions along said resilient member.

4,940,359

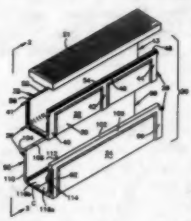
CHEMICAL SAFETY CONDUIT OR TRENCH

Phillip L. Van Duyn, Akron; Jorg R. Barenwald, Chardon, and Kenneth E. Kruse, Solon, all of Ohio, assignors to ACO Polymer Products, Inc., Chagrin Falls, Ohio

Filed Feb. 17, 1989, Ser. No. 312,892

Int. Cl.[5] E01F *5/00*

U.S. Cl. 405—118 **21 Claims**



1. An elongate safety conduit for receiving liquids, comprising:

first and second precast polymer concrete conduit elements each having imperforate bottom and side wall portions,

the first conduit element located and retained within the second and constructed and arranged to allow liquid access thereto from outside the second,

the second conduit element bottom and side wall portions enveloping those of the first,

means within the second conduit element for engaging the first conduit element and positively locating the first conduit element above the bottom wall of the second conduit thereby providing a space between the outside of the bottom wall portion of the first conduit element and the inside of the bottom wall of the second suitable for collecting liquid that may leak through the enveloped wall portions, and

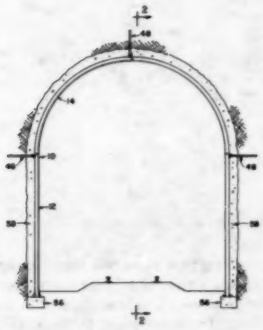
seal means along the length of the conduit between the two conduit elements at or adjacent to upper termini of interfaces between the enveloped and enveloping side wall portions of the two to adhere the two elements together and inhibit entry of liquid between said interfaces.

4,940,360

INSULATED TUNNEL LINER AND REHABILITATION SYSTEM

Raymond L. Webolt, 3119 W. Commodore Way, Seattle, Wash. 98199

Filed Jul. 27, 1987, Ser. No. 78,453
Int. Cl.[5] E21D *11/00*
U.S. Cl. 405—151 **13 Claims**



1. An insulating and rehabilitation system especially adapted to unlined rock tunnels, said system comprising:

(a) a modular system of sandwich panels with protected metal skins adhered to insulating cores, prefabricated and joined as a complete liner system to conform with tunnel dimensions and clearance requirements,

(b) a footing for said liner system arranged to provide continuous support and alignment for the system and insulate against thermal transfer to the tunnel wall, and

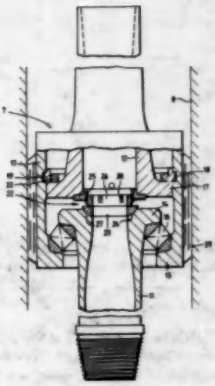
(c) a system of filling the void between said liner system and the rock face of said tunnel with a lightweight, chemically hardening structural material to maintain the present position of unstable, key rocks in said tunnel arches and walls.

4,940,361

DEVICE IN A FLEXIBLE TENSION LEG

Bjorn Paulshus, Slengasen 7, 2020 Skedsmo, Norway, and Phil Hawley, Minwear Crowthrone Farm, Crowthrone, Berkshire, United Kingdom

Filed Jun. 26, 1989, Ser. No. 371,584
Claims priority, application Norway, Jun. 24, 1988, 882804
Int. Cl.[5] B63B *21/50*; F16B *21/00*
U.S. Cl. 405—224 **7 Claims**



1. A device in a flexible tension leg member of the kind that comprises a hollow cylindrical casing, first and second coaxial tension leg elements which extend into said casing from its opposite ends. an outward projecting bearing flange at the end of the first tension leg element which sits in said casing, an inward projecting bearing flange in said casing, an elastomeric bearing member surrounding the first tension leg element and bearing against its bearing flange and on the other side bearing against inward projecting bearing flange in said casing, a rigid connection between said second tension leg and casing and a spacer between opposite tension leg elements inside said casing, said spacer comprising a spheric face facing a spheric bearing face on one tension leg element, characterized in that the spacer has an adjustable stop towards the other of opposite tension leg element ends.

4,940,362

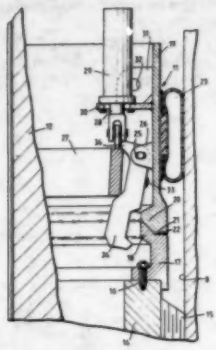
PACKING MEANS FOR A FLEXIBLE TENSION LEG IN A TENSION LEG PLATFORM

Bjorn Paulshus, Slengasen 7, 2020 Skedsmo, Norway, and Phil Hawley, Minwear Crowthrone Farm, Crowthrone, Berks, England

Filed Jun. 27, 1989, Ser. No. 372,053
Claims priority, application Norway, Jun. 27, 1988, 882846
Int. Cl.[5] E02D *5/74*
U.S. Cl. 405—224 **8 Claims**

1. In a tension leg platform having a flexible tension leg member comprising upper and lower tension leg elements and a casing within which said upper and lower tension leg elements are flexibly joined, the platform having a vertical shaft wall in which said casing is supported and bearing means between said casing and said shaft wall; the improvement

comprising means releasably interconnecting said upper tension leg element to said casing, and packing means surrounding



said upper tension leg element and releasably sealing between said upper tension leg element and said shaft wall.

4,940,363

MINE ROOF SUPPORT ASSEMBLY

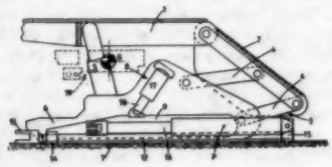
Stephen A. Brown, Cheltenham, and Neville J. H. Sleigh, Gloucestershire, both of England, assignors to Meco Mining Equipment Limited, Tewkesbury, England

Filed Nov. 17, 1989, Ser. No. 437,883

Claims priority, application United Kingdom, Sep. 21, 1989, 8921333

Int. Cl.[5] E21D *23/04, 15/44*

U.S. Cl. 405—296 10 Claims



1. A mine roof support assembly comprising a mine roof support having a first end in use adjacent to the mine face and a second end in use remote from the mine face, an advancing mechanism for advancing the roof support towards the mine face, and a base lifting mechanism including an arm member pivotally connected to a base section of the mine roof support at a position adjacent to the second end of the mine roof support, and a lifting ram which acts between the arm member and the roof support, the lifting ram acting on the roof support at a position which is nearer than the centre of gravity of the roof support assembly to the second end of the roof support to pivot the roof support relative to the arm member and thereby lift the first end of the roof support clear of the ground.

4,940,364

CONCRETE CONSTRUCTION UNITS AND MULTI-PLY CONCRETE COMPOSITES MADE THEREFROM

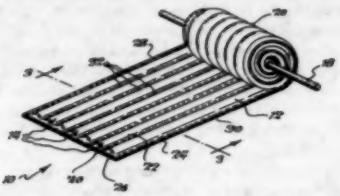
Leonard T. Dlugosz, 4 Minden Dr., Orchard Park, N.Y. 14127

Filed Oct. 14, 1988, Ser. No. 257,641

Int. Cl.[5] E02D *27/01*

U.S. Cl. 405—229 27 Claims

1. A concrete construction unit, which comprises a mat-like structure having enhanced load bearing properties making it useful in the construction of walls and wall panels, floors, pavements, road beds, support pads, foundations, domes, roofs, poles, pillars and bridge supports, said mat having a closed, water permeable outer shell which is substantially impermeable to concrete aggregate, said shell being subdivided into a plurality of connected, parallel tubular compartments, said compartments comprising a sufficient amount of a dry cementitious material to provide individual, longitudinally uniform,



segregated concrete bodies, said bodies being in an even plane relative to one another, the porosity of said outer shell and packing of said dry cementitious material therein being sufficient to effectuate controlled chemical hydration, said concrete construction unit characterized by formation of a substantially rigid monolithic structure upon curing.

4,940,365

MINE ROOF SUPPORT PLATE BOLT

Richard A. Rozanc, Muse, Pa., assignor to Ground Control, Inc., Cecil, Pa.

Filed May 18, 1989, Ser. No. 353,904

Int. Cl.[5] E21D *20/02*

U.S. Cl. 405—261 14 Claims

1. In a mine roof support plate bolt formed from a metallic elongated rod, having a head and flange at one end thereof and a channeled section having a helical channel in said rod adjacent the other end, for securement by resin in a bore hole having a closed end, the improvement comprising:

a threaded section on said rod adjacent the channeled section thereof; and

an expansion anchor threadedly engaged on the threaded section comprising a wedge and hollow shell; with the channeled section of said rod being of such a length greater than the length of said anchor such that a major portion of said channeled section is exposed regardless of the positioning of said expansion anchor on said threaded section;

whereby the expansion anchor provides initial securement in the bore hole while the resin is mixed and pumped towards the closed end of the bore hole by said helical channel and then sets up to secure the support plate bolt in said bore hole.

4,940,366

METHOD OF TREATING BACKFILL

Toshiro Suzuki, 1160-12, Morooka-cho, Kohoku-ku, Yokohama-shi, Japan

PCT No. PCT/JP87/00425, § 371 Date Feb. 26, 1988, § 102(e) Date Feb. 26, 1988, PCT Pub. No. WO88/00260, PCT Pub. Date Jan. 14, 1988

PCT Filed Jun. 25, 1987, Ser. No. 180,106

Claims priority, application Japan, Jul. 1, 1986, 61-154623

Int. Cl.[5] E02D *3/12*

U.S. Cl. 405—267 18 Claims

1. The method of preparing soil for back-filling an excavation and backfilling thereof comprising the steps of:

(a) removing excess water from said soil;

(b) homogeneously mixing a cementitious material with said soil;

(c) homogeneously mixing small ice particles with said soil, the temperature of which is above the freezing temperature of water;

(d) backfilling the homogeneous mixture of soil, cementitious material and small ice particles into an excavation.

4,940,367

PNEUMATIC FLOCK FEED SYSTEM FOR SUPPLYING MULTIPLE CARDS AND/OR STAPLE CARTING MACHINES

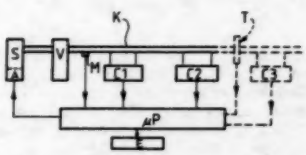
Christoph Stäheli, Frauenfeld, and Urs Staehli, Turbenthal, both of Switzerland, assignors to Rieter Machine Works, Ltd., Winterthur, Switzerland

Filed Aug. 4, 1988, Ser. No. 228,529

Claims priority, application Switzerland, Aug. 12, 1987, 03109/87

Int. Cl.[5] B65G *53/66*

U.S. Cl. 406—30 24 Claims



1. A fiber processing plant comprising

a pneumatic flock feed system for conveying a flow of flock, said feed system including a flock supply means for supplying flock into said system at a preselected constant rate;

a plurality of fiber processing machines connected to said system for receiving flock therefrom; and

control means connected to said flock supply means to switch said flock supply means on and off for controlling the overall amount of flocks conveyed in said system in a stop-go operation with said preselected rate, said control means being adjustable in dependence on the number of fiber processing machines in operation.

4,940,368

PROPULSION SYSTEM AND PROCESS FOR PNEUMATIC PIPELINE TRANSPORT

Mihail I. Marcu, 118 Locke St. N., Hamilton, Ontario, L8R 3A8, Canada

Filed Apr. 28, 1988, Ser. No. 187,468

Int. Cl.[5] B61D *13/10*

U.S. Cl. 406—79 1 Claim

1. A propulsion system for pneumatic pipeline transport of wheeled containers comprising:

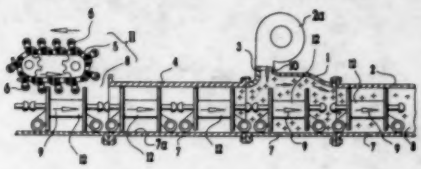
(a) a continuous tubular main pipeline section with an input end and an open output end;

(b) a secondary tubular pipeline section of smaller diameter than the main pipeline section with an open inlet end and an output end;

(c) a single generally tubular air injection manifold pipeline section of larger diameter than the main and secondary pipeline sections with an input end and an output end;

(d) a single device to inject high pressure air into the main pipeline via the manifold section;

(e) wherein the output end of the secondary pipeline is connected to the input end of the manifold section and the output end of the manifold section is connected to the



input end of the main pipeline section to form a continuous pneumatic pipeline;

(f) wheeled containers;

(g) a single forced introduction device in the form of a mechanical conveyor being located outside the pipeline to introduce the containers into the input end of the secondary pipeline section; and

(h) wherein the propulsion of the wheeled containers in the main pipeline section is solely provided by the single injection device.

4,940,369

MILLING CUTTER WITH INDEXABLE INSERTS

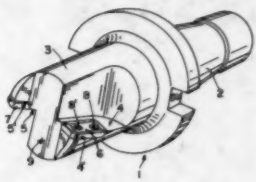
Gilbert Aebi, Trelex; Pierre Raye, Gland, both of Switzerland; Maurice J. A. David, Nantes, and Michel E. A. Marianneau, La Montagne, both of France, assignors to Stellram S.A., Nyon, Switzerland

Continuation-in-part of Ser. No. 29,155, Mar. 20, 1987. This application Jan. 13, 1989, Ser. No. 296,742

Claims priority, application Switzerland, Mar. 27, 1986, 01237/86

Int. Cl.[5] B23C *5/10*

U.S. Cl. 407—42 9 Claims



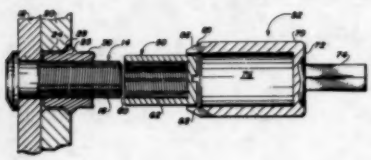
1. A milling cutter having indexable inserts, comprising

(a) a body including a front portion containing at least two indentations each defining a housing having a bottom surface which defines a positioning angle other than 0° with the longitudinal axis of said body; and

(b) a cutting insert removably connected with each housing and including a corner portion emerging from a face of said body front portion and a main cutting edge extending beyond and along an external lateral rim of the indentation, said insert having a rake face comprising a flat central depression and a sloped portion having an inclination which varies along its length relative to said flat central depression extending from said flat central depression to said main cutting edge and a clearance face of variable normal clearance along its length forming with said sloped portion a constant wedge angle, wherein the variable

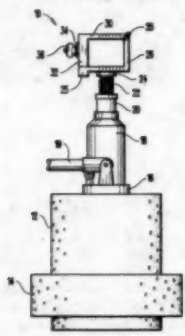
incline of the sloped portion and clearance face are selected to coact with the positioning angle to impart to the cutter a constant radial rake and clearance angle.

4,940,370
INNER LUG REMOVAL TOOL
Gregory L. Gipson, 4748 N. 28th Dr., Phoenix, Ariz. 85017
Filed Oct. 16, 1989, Ser. No. 421,850
Int. Cl.[5] B23B *49/00*
U.S. Cl. 408—72 R **8 Claims**



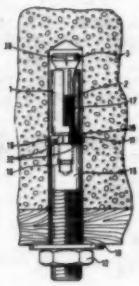
1. A tool for removing a seized or broken lug engaged on a threaded shaft comprising:
(a) a pilot member having a generally cylindrical exterior surface and defining an interior axially extending threaded bore threadably engageable with said shaft;
(b) a cutter member having a body defining a guided bore rotatively engageable about the exterior surface of said pilot member, said cutter having cutting means on said body at a location engageable with at least a portion of said nut; and
(c) means for rotating said cutter.

4,940,371
TRAILER LOCK DOWN DEVICE
George M. Cholovich, 262 Ben Putnam Rd., SW., Resaca, Ga. 30735
Filed Jul. 19, 1989, Ser. No. 381,807
Int. Cl.[5] B60D *1/00*
U.S. Cl. 410—101 **1 Claim**



1. A trailer lock down device, comprising:
a base;
a ground insertion anchor on said base for securing said base at an intended location;
said ground insertion anchor including an elongated rod provided with a plurality of axially spaced radially extending flanges adapted for encapsulation in a concrete block;
a hydraulic jack on said base;
a shaft mounted for selective vertical extension and retraction by said jack;
a threaded extension member telescopically received in coaxial relation in a free upper end of said shaft;
a first L-shaped member secured to a free upper end of said extension member;
a second L-shaped member secured to by a hinge to said first L-shaped member, said second L-shaped member movable to a closed position, wherein said first and second members form an open ended box; and
a key actuated locking mechanism for securing said second L-shaped member in said closed position.

4,940,372
ANCHORING PLUG
Artur Fischer, Waldachtal, Fed. Rep. of Germany, assignor to fischerwerke Artur Fischer GmbH & Co. KG, Waldachtal, Fed. Rep. of Germany
Filed Feb. 12, 1988, Ser. No. 155,318
Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705654; Jun. 6, 1987, 3719034
Int. Cl.[5] F16B *13/06*
U.S. Cl. 411—32 **1 Claim**



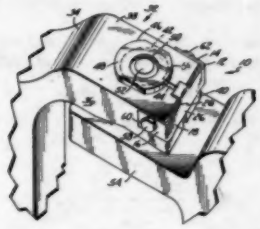
1. An anchoring plug for fastening objects to a support structure, comprising an expansible sleeve formed with a plurality of longitudinal slots at a leading end thereof, insertable into a hole drilled in the support structure, an expander body driven into said expansible sleeve to expand and clamp the latter in said hole, a screw connected to said expander body for driving said expander body into said expansible sleeve, and a bearing means against which said expansible sleeve is supported as said expander body is inserted into said expansible sleeve, said bearing means including a ring-shaped spring member and having an external diameter which is greater than an external diameter of said expansible sleeve, said bearing means being compressible in the hole of the support structure to said external diameter of said expansible sleeve to be pressed radially against a peripheral wall of the hole so as to support said expansible sleeve, and means for centering said ring-shaped spring member before and during assembly and promoting an expansion process and including a projection formed on said expansible sleeve and provided with an annular surface corresponding in shape to a cross-section of said ring shaped spring member so as to laterally press said ring-shaped spring member from inside radially outwardly against the peripheral wall of the hole during expansion of said expansible sleeve.

4,940,373
NUT AND BOLT LOCKING EMCHANISM
Gerald A. Specktor, St. Paul, Minn., assignor to Shim-A-Line, Inc., Minneapolis, Minn.
Filed Sep. 26, 1989, Ser. No. 412,677
Int. Cl.[5] F16B *39/04*; B62D *3/00*
U.S. Cl. 411—87 **13 Claims**

1. A nut and bolt locking mechanism comprising:
first and second locking plates;

means for holding the first and second locking plates in fixed positions with respect to one another; and

the first and second locking plates having coaxial openings,



the opening through the first locking plate being shaped and sized to fit the head of a selected type of bolt and the opening through the second locking plate being shaped and sized to fit a selected type of nut.

4,940,374

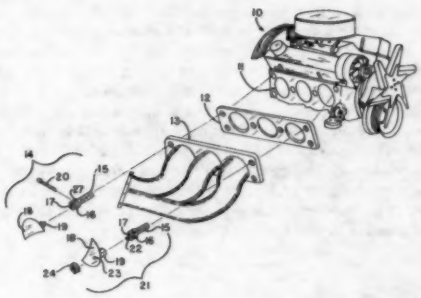
LOCKING BOLTS FOR VEHICLE EXHAUST MANIFOLD PIPES

Roy L. Gallagher, 13200 E. Harney La., Lodi, Calif. 95240

Filed Oct. 24, 1988, Ser. No. 261,717

Int. Cl.[5] F16B *39/10*

U.S. Cl. 411—120 **2 Claims**



1. An anti-rotation locking assembly for releasably fastening automotive exhaust pipes and exhaust manifolds to an engine block, said assembly comprising in combination:

A. a generally cylindrical threaded shaft for engaging threaded holes in an automotive cylinder block;

B. a headed portion proximate said threaded shaft further comprising:

1. a hexagonal wrenching recess co-axial with said threaded shaft;

2. a plurality of holes trans-axial of said threaded shaft;

C. a locking plate of hyperbolic shape trans-axial of said threaded shaft and further comprising:

1. a hexagonal stud extending co-axially from the proximate center of said locking plate to engage said headed portion;

2. a plurality of holes in said stud, trans-axial of said threaded shaft receiving a cotter pin when the holes in the stud and headed shaft are aligned to securely lock the hyperbolic locking plate trans-axial to the threaded shaft and thereby prevent the threaded shaft from working loose due to vibration.

4,940,375

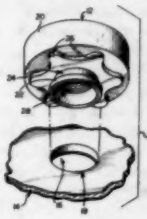
CLINCH TYPE FASTENER STRUCTURE AND TOOLING

Michael D. Marvell, Rockford, Ill., and John S. Milliser, Rochester, Ind., assignors to Textron Inc., Providence, R.I.

Filed May 19, 1989, Ser. No. 354,640

Int. Cl.[5] F16B *37/04*; B23P *11/00*

U.S. Cl. 411—181 **9 Claims**



1. A joint assembly in which a fastener of the self-clinching type is secured to an apertured sheet material, comprising: a fastener including a head and shank portion with a locking groove formed in said shank; a generally planar-surfaced, apertured sheet material; said fastener shank portion projecting through said aperture and said fastener head at least partially embedded within peripheral material surrounding said sheet material aperture, and a portion of said peripheral material is disposed within said groove to form a mechanical interlock therewith to secure said joint assembly; said shank comprising an outwardly flared end portion having an exposed surface thereof coplanar with an exposed, opposite surface of said sheet material in relation to said embedded fastener head.

4,940,376

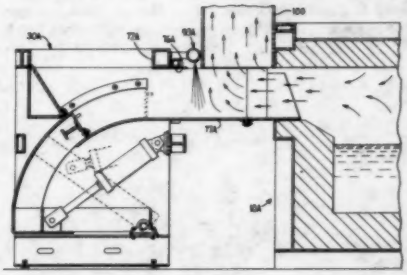
SCRAP LOADER FOR MOLTEN METAL FURNACE

John McCarthy, Benton Harbor, Mich., assignor to MPH Industries, Inc., Riverside, Mich.

Filed Oct. 12, 1988, Ser. No. 256,730

Int. Cl.[5] F27D *3/04*; B65G *65/02*

U.S. Cl. 414—198 **9 Claims**



1. A scrap loader for a molten metal furnace, comprising:

a loader housing to be positioned beside a molten metal furnace, said housing including a chamber having an inlet portion for receiving metal scrap and an outlet port through which said metal scrap is to be fed into the furnace;

means for feeding metal scrap to said chamber;

a ram assembly in said housing and comprising:

(a) a leg means pivoted with respect to said housing, and pivot means fixed with respect to said housing near said furnace and spaced below said chamber, said leg means having a retracted position extending generally hori-

zontally away from said pivot means and furnace below said chamber,

(b) a ram fixed on said leg means and pivotable therewith along a wall of said chamber past said inlet port and toward said outlet port, said ram being curved about the axis of said pivot means, said ram having a rest position extending up from said leg means remote from said furnace and curving back over a portion of said leg means, said chamber and ram defining an upper boundary and said leg means defining a lower boundary of an approximately triangle shaped space diverging upwardly and toward said furnace,

(c) means actuable for pivotally advancing and retracting said ram along said chamber wall and therewith for driving metal scrap along said wall and through said outlet port into the furnace, said ram advancing means comprising an elongate longitudinally expandable and contractible linear motor fixed pivotally with respect to said housing near said furnace on a pivot vertically spaced between said pivot means of said leg means and said chamber, said elongate linear motor extending from said pivot into and being housed within said approximately triangle shaped space below said ram and chamber and above said leg means, said linear motor having a free end portion fixed adjacent a joinder of said ram to said leg means, said elongate linear motor having a rest position approximately bisecting the angle between said ram and leg means, said elongate linear motor being contractible to pivot said leg means up and advance said ram past said inlet port and toward said outlet port of said chamber.

4,940,377

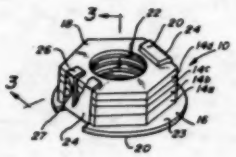
LAMINATED NUT HAVING CAGE WITH NESTED FINGERS AND METHOD OF MANUFACTURE

Richard L. Reynolds, Grosse Pointe Shores, Mich., assignor to Pac-Fasteners, a Michigan partnership, Southfield, Mich.

Filed Aug. 2, 1989, Ser. No. 388,658

Int. Cl.[5] F16B *37/08, 39/12*

U.S. Cl. 411—432 13 Claims



1. A laminated nut comprising a plurality of conical spring discs, a cage for receiving and holding said spring discs in a stacked, aligned relationship to define a central opening threaded to be matably received upon an associated threaded bolt, said cage including a bottom plate portion and a plurality of axially extending fingers cooperating with said plate portion to hold said spring discs in said stacked, aligned relationship, said spring discs having a plurality of circumferentially disposed flats, axially extending slots located in said flats, said fingers located in said slots.

4,940,378

POSITIONING DEVICE FOR POSITIONING A LOAD CARRYING PLATFORM RELATIVE TO A DOCKING STATION

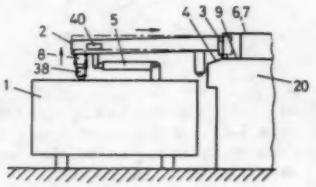
Hans-Ueli Feldmann, Safnern, and Ueli Heiz, Bern, both of Switzerland, assignors to JD-Technologie AG, Zug, Switzerland

Filed Sep. 28, 1989, Ser. No. 413,993

Claims priority, application Switzerland, Sep. 29, 1988, 3618/88

Int. Cl.[5] B65G *67/00*

U.S. Cl. 414—401 10 Claims



1. Positioning device for the accurate positioning of a load carrying platform of a conveyor vehicle relative to a fixed docking station, comprising a conveyor vehicle with a base portion and a load carrying platform displaceably supported on said base portion and movable relative thereto along a substantially horizontal axis of extension from a rest position into at least one extended position, said load carrying platform having at least one front end with first positioning means, lifting means located near an end opposite to said at least one front end and a levelling device for controlling said lifting means, and further comprising a fixed docking station, said docking station comprising second positioning means, which second positioning means have incline means ending on a defined level, whereby, while said conveyor vehicle is positioned adjacent to said docking station said platform is moved from said rest position into said extended position, said first positioning means will cooperate with said incline means to raise said front end of said platform to said defined level, and whereby said lifting means simultaneously are operative to lift said end opposite to said front end in order to adjust said platform to a levelled position during its movement from said rest position to said extended position.

4,940,379

TRUCK LOADING

Ruediger Staege, Am Pfuhl 11-13, D-1000 Berlin 45, Fed. Rep. of Germany

Filed Mar. 31, 1986, Ser. No. 846,702

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1985, 3511455

Int. Cl.[5] B65G *67/02*

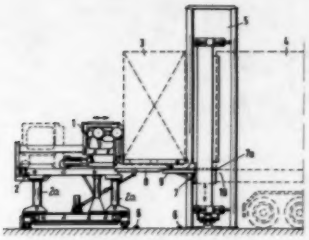
U.S. Cl. 414—401 3 Claims

1. Loading device, for automatic rear end loading of trucks or trailers by means of a forklifting type device movably mounted on a platform that can be lowered and lifted, the improvement comprising:

a docking and loading gate defining a particular position for the rear end of a truck or trailer on one hand and of a direction of loading on the other hand, the position being established with respect to the truck or trailer when positioned in and at the loading dock; and

a loading bridge arranged in said loading gate for bridging space between said loading platform on one hand and a load bearing surface of a truck or trailer when in the loading dock on the other hand, there being means for

lowering said bridge to obtain particular positions in which the bridge engages a rear portion of the load surface and exerts a particular load upon the truck or trailer in said loading gate.

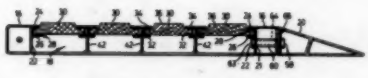


4,940,380

LOAD ELEVATOR PLATFORM FOR TRUCK OR THE LIKE

Jan Ballyns, Pickering; John C. Martin, and Paul H. Martin, Toronto, all of Canada, assignors to Diesel Equipment Limited, Toronto, Canada

Filed Feb. 17, 1989, Ser. No. 311,757
Int. Cl.[5] B60P *3/00*
U.S. Cl. 414—495 **8 Claims**



1. In a load elevator for raising and lowering a load with respect to the bed of a truck, the improvement of a light-weight elevator platform comprising:

(a) a plurality of light-weight floor boards, each having oppositely disposed side edges and oppositely disposed ends,

(b) a frame having oppositely disposed first frame members and oppositely disposed second frame members connected to one another to define a rectangular-shaped floor board enclosure, said frame members each having a side face which is directed inwardly of the enclosure,

(c) a plurality of support rails each having oppositely disposed side faces and oppositely disposed ends,

(d) means for releasably securing the ends of said support rails to the first frame member to releasably retain the support rails in a position extending between the first frame members in a spaced parallel relationship to the second frame members,

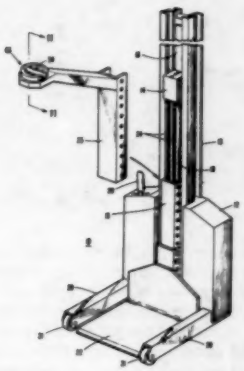
(e) a mounting channel at said side face of each second frame member and at each side face of each support rail, said mounting channels each having upper and lower walls forming seats releasably retaining a marginal side edge portion of one of the floor boards to retain one floor board along the length between each support rail and between the second frame members and an adjacent support rail, said floor boards and support rails being otherwise free of attachment to one another so as to be readily assembled and disassembled by releasing said means for releasably securing the ends of the support rails to the first frame members.

4,940,381

MOBILE HOIST

Ambrose L. Rysewyk, Elgin, Ill., assignor to American Telephone and Telegraph Company, New York, N.Y.

Filed Aug. 26, 1988, Ser. No. 237,253
Int. Cl.[5] B66F *19/00*
U.S. Cl. 414—619 **10 Claims**



1. A hoist comprising:

an elongated housing;

a mast extending upwards from said housing;

a hydraulic cylinder mounted in an upward position within said mast;

a piston slidably mounted within said cylinder having one of its ends extending from the upward end of said cylinder;

an upper slide slidably mounted on said mast and attached to the portion of the piston extending from said cylinder;

a lower slide slidably mounted on said mast;

means for interconnecting said upper and lower slides;

a load lifting means attached to said lower slide;

a hydraulic system for generating a hydraulic fluid flow to or from said cylinder;

a metering valve for regulating said hydraulic fluid flow to and from said cylinder such that hydraulic fluid flow through said valve is nonlinear, said metering valve including;

a valve body having an inlet and an outlet port;

a passage connecting said ports;

a spherical ball positioned in said inlet port;

a spring for keeping said ball against the connecting passage thereby blocking said passage to prevent hydraulic fluid flow through said passage;

a cam having a camming surface of predetermined shape and dimension;

a structure for rotatably supporting said cam;

a control lever affixed to said cam for rotating said cam;

means in contact with said camming surface and with said spherical ball for moving said ball away from the passage to allow hydraulic fluid flow through the passage; and

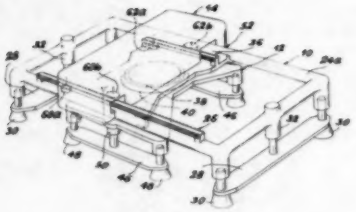
a shuttle valve means which vents the hydraulic system to the atmosphere allowing said piston to extend from the cylinder and prevents hydraulic fluid leaks from the hydraulic system when said piston is in its lowest position within the cylinder.

4,940,382

AUTONOMOUS MOVING BODY FOR TRANSPORTING A TOOL AT A CONSTANT SPEED

Yves Castelain, L'Isle Jourdain; Philippe Jaubert, Cologne, and René Peltier, Colomiers, all of France, assignors to Aerospatiale Societe Nationale Industrielle, Paris, France

Filed Dec. 23, 1988, Ser. No. 289,206
Claims priority, application France, Dec. 31, 1987, 87 18478
Int. Cl.[5] B25J *5/00*
U.S. Cl. 414—750 **9 Claims**



1. Autonomous moving body able to move a working tool at a constant speed over a surface having a random shape and orientation, characterized in that it comprises:

two attachment assemblies cooperating with one another by guidance means authorizing a relative displacement between said assemblies in a given direction, each of the attachment assemblies carrying attachment members able to adhere to the said surface and means for displacing these attachment members for moving towards and away from said surface;

a tool holder assembly supported by at least one of the attachment assemblies and cooperating with the latter through guidance means authorizing its displacement in said direction; and

control means, whose operation ensures the passage of the moving body into two successive and repetitive displacement states; a first of these states, in which the attachment members of only one of the attachment assemblies, said to be fixed, adhere to the said surface, ensuring a displacement of the tool holder assembly and the other attachment assembly, said to be mobile, in the said direction and respectively at a relatively low speed and a relatively high speed; the second state, in which the attachment members of the two attachment assemblies adhere to the said surface, ensuring a displacement of the tool holder assembly in said direction and at said relatively low speed with respect to the attachment assemblies; the fixed and mobile attachment assemblies of two successive first states separated by a second state being interchanged.

4,940,383

SYSTEM FOR ADMITTING STEAM INTO A TURBINE

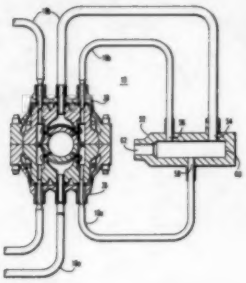
George J. Silvestri, Jr., Winter Park, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Jul. 21, 1989, Ser. No. 383,391
Int. Cl.[5] F01D *17/18*
U.S. Cl. 415—44 **8 Claims**

1. An improved method of admitting steam into a steam turbine having an upper casing and a lower casing with a large nozzle chamber and at least one small nozzle chamber in each of the casings through which steam is admitted into the turbine, the method comprising the steps of:

controlling steam flow to each nozzle chamber with a single correspondingly-sized steam supply port and associated valve in a steam chest;

orienting adjacent ones of the steam supply ports in opposite directions within the steam chest so that steam flow destined for nozzle chambers in the upper casing is directed upwardly, and steam flow destined for nozzle chambers in the lower casing is directed downwardly; and



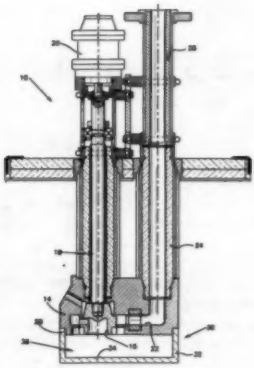
connecting each of the ports to its corresponding nozzle chamber with a single pipe means and an inlet pipe.

4,940,384

MOLTEN METAL PUMP WITH FILTER

Lutfi H. Amra, Cleveland Hts.; Thomas M. Byrne, Jr., Cleveland; Harvey Martin, Solon; George S. Mordue, Ravenna, and David V. Neff, Euclid, all of Ohio, assignors to The Carborundum Company, Niagra Falls, N.Y.

Filed Feb. 10, 1989, Ser. No. 309,613
Int. Cl.[5] F04D *29/70*
U.S. Cl. 415—121.2 **19 Claims**



1. A molten metal pump, comprising:

a base member, the base member having a fluid inlet; and

a filter secured to the base member and defining

a cavity therebetween, the filter completely surrounding the inlet, wherein the filter is made from bonded or sintered refractory material.

4,940,385

ROTARY DISC PUMP

Max I. Gurth, 1781 Carob Tree La., El Cajon, Calif. 92021

Filed Apr. 25, 1989, Ser. No. 343,536
Int. Cl.[5] F01D *1/36*
U.S. Cl. 415—206 **14 Claims**

1. A rotary disc pump, comprising:

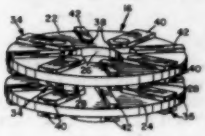
a housing having an inner cylindrical rotor chamber;

an inlet at one end of said chamber;

an outlet communicating with the outer periphery of said chamber;

an impeller shaft rotatably mounted at one end of said chamber;

at least two parallel, spaced discs disposed co-axially in said rotor chamber and connected together for rotation about



their center axis, one of said discs comprising a drive disc mounted on said impeller shaft;

the inner opposing faces of said discs being spaced a predetermined distance apart; and

a plurality of raised vanes mounted on at least one of said opposing faces, the height of the vanes being less than the spacing between the discs.

4,940,386

MULTIPLE FLOW TURBOJET ENGINE WITH AN OUTER RING OF THE FAN OUTLET SHRUNK ONTO THE CASE

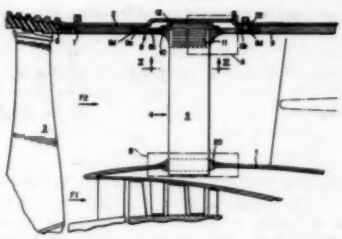
Thierry Feuvrier, Noisy-le-Roi, and Alexandre Forestier, Vaux le Penil, both of France, assignors to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.-M.A." , Paris, France

Filed Feb. 4, 1988, Ser. No. 152,337

Claims priority, application France, Feb. 5, 1987, 87 01394

Int. Cl.[5] F04D *29/54*

U.S. Cl. 415—209.2 **5 Claims**



1. Multiple flow turbojet engine with a fan outlet which comprises:

a stage of fixed guide vanes without platforms placed at regular intervals between an inner ring and an outer ring, wherein the outer ring comprises a single-piece, annular cartridge **8** made of composite material comprising two solid lateral strips whose outer surface is positioned within the interior of an outer case for the cold flow of the turbojet engine and whose inner surface comprises two lateral recesses for support of the edges of soundproofing panels placed upstream and downstream from said cartridge and positioned between the two lateral strips a narrowed central part that connects the two lateral strips and which has a plurality of slots for attaching guide vanes of the fan outlet and wherein a radially outer end of the blade of each guide vane of the fan outlet has a cover positioned thereon for cooperation with said slots and which is made of a molded elastomer,

said cover having a widened outer edge having a groove and an outer and inner lip, said outer lip being hooked onto the outer face of a slot (**10**) of said narrowed central part of the cartridge and said inner lip being housed in a slot formed on a radially inner face of said cartridge.

4,940,387

WATER TURBINE ARRANGEMENT FOR POWER GENERATION

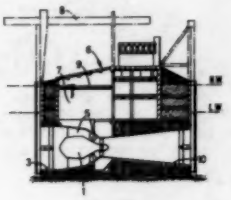
Colin Horne, 2 Dene Cottage, Milley Rd, Waltham St. Lawrence, Reading, England, and Edward B. Morgan, 20 Manor Close, Shrivenham, Swindon Wiltshire, United Kingdom

Filed May 4, 1989, Ser. No. 347,405

Claims priority, application United Kingdom, May 11, 1988, 8811159

Int. Cl.[5] F01D *15/10*; F04D *29/60*

U.S. Cl. 415—221 **4 Claims**



1. A water turbine arrangement in which at least one water turbine is located in the path of a water source for power generation, comprising a barrage structure which extends across and above the level of the water source, and in which the barrage structure is of a cross-sectional width sufficient to absorb static and dynamic loading from said water source and defines only a draught tube for the turbine, characterized in that the turbine is mounted centrally within an annular inlet casing to form a separate turbine assembly, in that the turbine assembly has a support structure extending between an exterior surface of the turbine and an interior surface of the inlet casing and is mounted on further support means comprising a foundation member whereby the turbine assembly, in use, will transmit static and dynamic loading to the bed of the water source via said support structure, in that an outlet end of the inlet casing is provided, around its opening, with an annular radiussed or coned spigot designed to be fitted against a co-operating bearing surface formed around an inlet end of the draught tube to provide an articulate, releasable connection, and in that locking means are provided for effecting said releasable connection.

4,940,388

COOLING OF TURBINE BLADES

Jonathan R. Lilleker, Leeds; Harry Henshaw, and John L. Winter, both of Derby, all of England, assignors to Rolls-Royce plc, London, England

Filed Nov. 17, 1989, Ser. No. 437,900

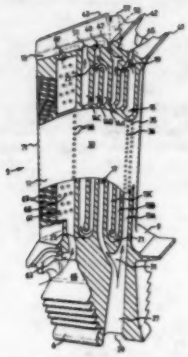
Claims priority, application United Kingdom, Dec. 7, 1988, 8828541

Int. Cl.[5] F01D *5/08*

U.S. Cl. 416—97 R **7 Claims**

1. An air cooled turbine blade for an axial flow gas turbine aeroengine has a root portion, an inner platform and an aerofoil, the aerofoil having a chordwise succession of substantially mutually parallel cooling air passages extending spanwise of the aerofoil, first and second pluralities of the passages being connected in flow series at their extremities to form respective separate first and second convoluted pathways in the leading edge and mid-chord regions of the aerofoil respectively, both said convoluted pathways being connected to a first cooling air entry port located below the inner platform, the trailing edge

portion of the aerofoil having at least one spanwise extending cooling air passage therein connected to a second cooling air



entry port located below the inner platform, in use the first entry port receiving cooling air at a high pressure and the second entry port receiving cooling air at a lower pressure.

4,940,389

ASSEMBLY OF ROTOR BLADES IN A ROTOR DISC FOR A COMPRESSOR OR A TURBINE

Gerd Luxenburger, Munich, Fed. Rep. of Germany, assignor to MTU Motoren- Und Turbinen-Union Munich GmbH, Munich, Fed. Rep. of Germany

Filed Dec. 7, 1988, Ser. No. 281,201

Claims priority, application Fed. Rep. of Germany, Dec. 19, 1987, 3743253

Int. Cl.[5] F01D *5/32*

U.S. Cl. 416—193 A **15 Claims**

1. A rotor wheel for compressors or turbines comprising a rotatable rotor disc having an axial length, and a plurality of rotor blades secured to said rotor disc and extending radially thereof in circumferentially spaced relation along said disc, said blades each including a foot engaged in a respective axial groove provided in said disc, each foot having a length equal to the axial length of said disc, and a foot plate spaced in entirety above said foot and forming a clearance space with said rotor disc with said foot engaged in said groove, said grooves in said disc defining successive circumferentially spaced teeth between adjacent grooves, and securing means integral with each rotor blade and said rotor disc to provide overlapping structural elements below the foot plate of the respective blade at said clearance space at a location for blocking axial movement of the blade relative to the rotor disc in one direction in the axial groove, said grooves in said disc having contoured axial side surfaces which form contoured side surfaces for said teeth, said feet of the blades having contoured axial surfaces for mating in said grooves, said structural elements of said securing means comprising an upstanding web on each tooth having said surfaces which are continuous with and smoothly merge with the contour of the side surfaces of said teeth, and two axially spaced depending radial wall parts on each said foot plate, said radial wall parts having side surfaces which are continuous with and smoothly merge with the contour of said feet of the rotor blade, said webs and said wall parts being developed to provide overlapping surfaces between each of said webs and a respective one of said wall parts to prevent relative axial movement of said rotor disc and said blades in one axial direction while the feet of the rotor blades occupy the entire length of the grooves in the disc.

4,940,390

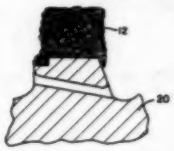
TURBINE SYSTEM HAVING MORE FAILURE RESISTANT ROTORS AND REPAIR WELDING OF LOW ALLOY FERROUS TURBINE COMPONENTS BY CONTROLLED WELD BUILD-UP

Robert E. Clark, Orlando, Fla., and Dennis R. Amos, Rock Hill, S.C., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Division of Ser. No. 190,324, May 5, 1988. This application May 11, 1989, Ser. No. 350,267

Int. Cl.[5] F04D *29/02*

U.S. Cl. 416—241 R **6 Claims**



1. In a steam turbine system of the type having a ferrous steam turbine component, said component having a worn surface thereon, the improvement comprising:

(a) a first layer of weld metal deposited on said worn surface, said deposition of said first layer producing a heat-affected zone in said component; and

(b) a second layer of weld metal deposited to said first layer, said deposition of said second layer tempering at least a portion of said heat-affected zone in said component, wherein said turbine component comprises about 1.05% to 1.35% by weight Cr, about 1.00% to about 1.30% by weight Mo, and about 0.21% to 0.29% by weight V.

4,940,391

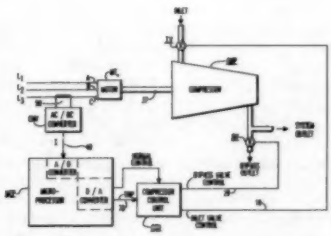
COMPRESSOR SURGE DETECTION SYSTEM

Robert T. Elms, Monroeville Boro; Clyde O. Peterson, Plum Boro, and Gary F. Saletta, Penn Township, Westmoreland County, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 7, 1988, Ser. No. 268,102

Int. Cl.[5] F04B *49/00*

U.S. Cl. 417—12 **4 Claims**



1. In a compressor system including a compressor driven by

an electric motor, a surge detection system comprising the following combination:

means for sensing the motor current to derive a current representative signal;

means responsive to said current representative signal for sampling over a sliding window a plurality of successive and consecutive samples thereof;

means for deriving one sample at a time as an instantaneous representation of the motor current magnitude;

means responsive to said plurality of samples for continuously deriving therefrom and through successive windows a signal representative of the average thereof;

comparator means responsive to a threshold signal and to said sample average for detecting a polarity signal representative of an excess in magnitude above and below said sample average;

means responsive to said polarity signal and to said one sample for detecting the occurrence of successive polarity changes in said polarity signal as an indication of an impeding surge; and

means for generating a surge indicative signal to be applied to the compressor system when said polarity changes have lasted during a predetermined time period.

4,940,392

JET PUMP WITH STABILIZED MIXING OF PRIMARY AND SECONDARY FLOWS

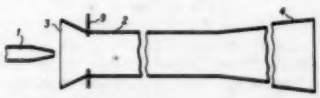
Richard C. Adkins, Buckinghamshire, England, assignor to British Aerospace PLC, London, England

Continuation of Ser. No. 131,500, Aug. 3, 1987, abandoned. This application Jan. 9, 1989, Ser. No. 294,999

Claims priority, application United Kingdom, Aug. 7, 1986, 8619277

Int. Cl.[5] F04F *3/00*

U.S. Cl. 417—151 **6 Claims**



1. A jet pump for reducing the noise generated by the flow of exhaust gas from a jet engine comprising:

a nozzle for a high speed primary flow produced by the exhaust of said jet engine;

a mixing tube into which said primary flow is directed by said nozzle;

an inlet to said mixing tube for a secondary flow, said inlet surrounding said primary flow nozzle; and

an orifice plate located in said mixing tube for changing the cross section of said mixing tube abruptly, in order to produce a rise in static pressure immediately downstream, thereby increasing mixing of the primary and secondary flows and stabilizing the mixing process.

4,940,393

SLANT PLATE TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

Yukihiko Taguchi, Maebashi, Japan, assignor to Sanden Corp., Japan

Filed Jan. 11, 1989, Ser. No. 295,733

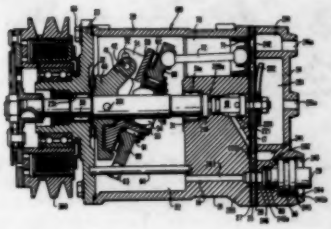
Claims priority, application Japan, Jan. 13, 1988, 63-3684

Int. Cl.[5] F04B *1/28*

U.S. Cl. 417—222 **16 Claims**

1. In a slant plate type refrigerant compressor including a compressor housing having a cylinder block, a front end plate at one end of said cylinder block and a rear end plate at the other end of said cylinder block, said cylinder block having a plurality of cylinders therein, a crank chamber enclosed within said compressor housing, a piston slidably fitted within each of said cylinders, a drive mechanism coupled to said pistons to reciprocate said pistons within said cylinders, said drive mechanism including a drive shaft rotatably supported in said housing, a rotor coupled to said drive shaft and rotatable with said drive shaft, and coupling means coupling said rotor to said pistons for converting rotary motion of said rotor into reciprocating motion of said pistons, said coupling means having a surface disposed at an inclined angle relative to a plane perpendicular to said drive shaft, said angle adjustable to vary the stroke length of said pistons and the capacity of said compressor, said rear end plate having a suction chamber and a discharge chamber, first and second passageways each linking said crank chamber to said suction chamber, and first and second valve control means for controlling the link of said crank chamber to said suction chamber through said first and said second passageways, respectively, to adjust the inclined angle in response to suction chamber pressure, the improvement comprising:

said second valve control means controlling said link of said



suction chamber to said crank chamber through said second passageway at a first and at a second control point corresponding to a first and a second value, respectively, of the suction chamber pressure, said second valve control means closing said second passageway when the suction chamber pressure is below the first control point, said second valve control means opening said second passageway when the suction chamber pressure is above the second control point, and

said first valve control means controlling the link of said suction chamber to said crank chamber through said first passageway at a third control point corresponding to a third value of the suction chamber pressure, said first valve control means opening said first passageway when the suction chamber pressure is above the third control point and closing said first passageway when the suction chamber pressure is below the third control point, the first control point being less than the third control point, the third control point being less than the second control point.

4,940,394

ADJUSTABLE WEARPLATES ROTARY PUMP

Gordon H. Gibbons, Penryn, Calif., assignor to Baker Hughes, Inc., Houston, Tex.

Filed Oct. 18, 1988, Ser. No. 259,079

Int. Cl.[5] F04B *49/00*; F04C *2/00*

U.S. Cl. 417—283 **5 Claims**

1. A rotary pump comprising:

a rotor casing having a pair of displaced semi-cylindrical facing cavities therein, a suction inlet port and a discharge port;

a first lobed rotor journalled within said casing and rotatable in one of said cavities;

a second lobed rotor identical to said first lobed rotor and journalled within said casing and rotatable in the other of said cavities, said lobed rotors interfitting to form pumping pockets between portions of said rotors and said cas-

ing, said pockets being movable from adjacent said inlet port to adjacent said discharge port;

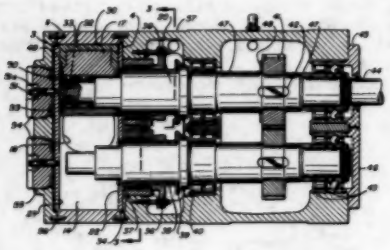
means for rotatably driving said rotors in opposite directions;

a first wearplate in close clearance and in juxtaposition with parallel faces of said rotors and sealing one end of said cavities; and

means for adjusting the clearance of said first wearplate with said rotor faces, said adjusting means being operable from the exterior of said rotor casing and comprising:

a pair of rotatably adjustable lugs extending from said rotor casing;

compression spring means positioned between an inner end



surface of said lugs and an outer surface of said first wearplate for compressively loading said first wearplate;

a pair of spaced threaded studs connected to and extending outwardly from said outer surface of said first wearplate, one of said studs extending juxtaposed to one of said lugs and the other of said studs juxtaposed to the other of said lugs; and

a stud nut on each of said threaded studs, such that said lugs are adjustable to preload said spring means to a set tension correlating to a selected pump operating pressure and wherein at said pump operating pressure tightening of said nuts adds additional compression to said spring means and pulls said first wearplate away from said rotor faces to a predetermined design clearance.

4,940,395

SCROLL TYPE COMPRESSOR WITH VARIABLE DISPLACEMENT MECHANISM

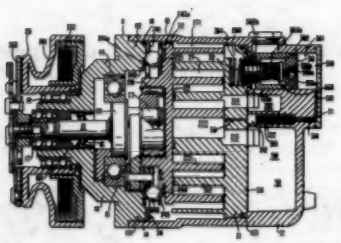
Tamaki Yamamoto, Honjo, and Atsushi Mabe, Isesaki, both of Japan, assignors to Sanden Corporation, Gunma, Japan

Filed Dec. 8, 1988, Ser. No. 281,342

Claims priority, application Japan, Dec. 8, 1987, 62-185949

Int. Cl.[5] F04B *49/02, 49/08*

U.S. Cl. 417—310 **8 Claims**



1. In a scroll type compressor including a housing having an inlet port and an outlet port, a fixed scroll disposed within said housing and having a first circular end plate from which a first spiral element extends into the interior of said housing, an orbiting scroll having a second circular end plate from which a second spiral element extends, said first and second spiral elements interfitting at an angular and radial offset forming a plurality of line contacts and defining a central fluid pocket and at least one pair of outer fluid pockets within the interior of said housing, a driving mechanism operatively connected to said orbiting scroll to effect orbital motion of said orbiting scroll, rotation preventing means for preventing the rotation of said orbiting scroll during orbital motion, said first circular end plate dividing the interior of said housing into a front chamber and a rear chamber, said front chamber communicating with said inlet port, said rear chamber further divided into a discharge chamber, an intermediate pressure chamber and a cylinder, said discharge chamber linked with said outlet port and with said central fluid pocket formed between said spiral elements, a one way valve means for providing fluid communication in one direction from said central fluid pocket to said discharge chamber, at least one pair of holes formed through said first circular end plate and forming a fluid channel between said outer fluid pockets and said intermediate pressure chamber, a communication passageway including said cylinder linking said intermediate pressure chamber with said front chamber, and control means disposed in said cylinder for controlling fluid communication between said intermediate pressure chamber and said front chamber through said cylinder, the improvement comprising:

a bypass channel linking said cylinder in fluid communication with said central fluid pocket, and

said control means comprising a piston slidably disposed within said cylinder and a control valve, said piston responsive to the fluid pressure in said central fluid pocket to slide in said cylinder to control the link between said intermediate chamber and said front chamber, said control valve controlling the link between said central fluid pocket and said front chamber through said piston.

4,940,396

HERMATIC SCROLL TYPE COMPRESSOR WITH TWO CASINGS AND CENTER BLOCKS

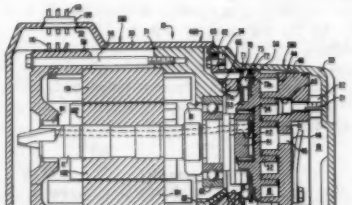
Shigemi Shimizu, Sakai; Kazuto Kikuchi, Honjo, and Kiyoshi Terauchi, Isesaki, all of Japan, assignors to Sanden Corporation, Japan

Continuation-in-part of Ser. No. 169,983, Mar. 18, 1988, Pat. No. 4,900,238. This application Jan. 13, 1989, Ser. No. 296,596

Claims priority, application Japan, Jan. 14, 1988, 63-6450

Int. Cl.[5] F04B *35/04;* F04C *18/04, 29/00*

U.S. Cl. 417—410 **16 Claims**



1. In a scroll type compressor with a hermetically sealed housing, the compressor comprising a fixed scroll fixedly disposed within said housing and having an end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having an end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to form a plurality of line contacts which define at least one pair of sealed off fluid pockets, a driving

mechanism including a motor supported in said housing, said driving mechanism being operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, rotation prevention means for preventing the rotation of said orbiting scroll during orbital motion thereof, whereby the volume of the fluid pockets changes during said orbital motion to compress the fluid in the pockets, the improvement comprising:

said housing including a first cup shaped casing and a second cup shaped casing, said first cup shaped casing housing said fixed scroll, said orbiting scroll and said rotation prevention means, said second cup shaped casing housing said driving mechanism which further includes a drive shaft, wherein said first and second cup shaped casings are joined to form said hermetically sealed housing;

a first center block being disposed within said first cup shaped casing, said first center block having a front surface and a rear surface, said rear surface being connected to a portion of said rotation preventing means;

a second center block being disposed within said second cup shaped casing and rotatably supporting one end of said drive shaft, said second center block having a front surface facing said first center block front surface; and

alignment means formed on engaging portions of said facing surfaces of said first and second center blocks for aligning said drive shaft with said orbiting scroll, said alignment means comprising an annular recess formed at an inner portion of said first center block and an annular projection formed on said second block, said alignment means further comprising a guide surface formed on said front surface at said first center block for guiding said second center block therealong and towards said annular recess, said guide surface extending radially outwardly from said annular recess.

11. In a scroll type compressor with a hermetically sealed housing, the compressor comprising a fixed scroll fixedly disposed within said housing and having an end plate from which a first wrap extends into the interior of said housing, an orbiting scroll having an end plate from which a second wrap extends, said first and second wraps interfitting at an angular and radial offset to form a plurality of line contacts which define at least one pair of sealed off fluid pockets, a driving mechanism including a motor supported in said housing, said driving mechanism being operatively connected to said orbiting scroll to effect the orbital motion of said orbiting scroll, rotation preventing means for preventing the rotation of said orbiting scroll during orbital motion thereof, whereby the volume of the fluid pockets changes during said orbital motion to compress the fluid in the pockets, the improvement comprising:

said housing including a first cup shaped casing and second cup shaped casing, said first cup shaped casing housing said fixed scroll, said orbiting scroll and said rotation preventing means, said second cup shaped casing housing said driving mechanism which further includes a drive shaft, wherein said first and second cup shaped casings are fused together to form said hermetically sealed housing;

a first center block being disposed within said first cup shaped casing and being releasably secured thereto;

a second center block being disposed within said second cup shaped casing and rotatably supporting one end of said drive shaft; and

a rear support block being disposed within said second cup shaped casing, said rear support block supporting the other end of said drive shaft and being releasably secured to and solely supported by said second center block.

4,940,397

FUEL PUMP HAVING A PRESSURE CHAMBER VENTED VIA A BALL VALVE TO THE FUEL TANK

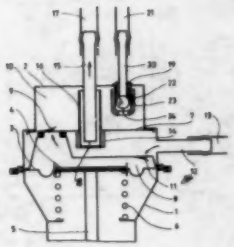
Ernst Kuhlen, Willich, Fed. Rep. of Germany, assignor to Pierburg GmbH, Neuss, Fed. Rep. of Germany

Filed Feb. 6, 1989, Ser. No. 307,420

Claims priority, application Fed. Rep. of Germany, Jun. 21, 1988, 3820887

Int. Cl.[5] F04B *43/02*

U.S. Cl. 417—435 **11 Claims**



1. In a fuel pump driven by an internal combustion engine and adapted for attachment thereto, the pump being provided with a work chamber having an inlet suction valve and an outlet pressure valve, the improvement comprising a pressure chamber downstream of the work chamber and in communication therewith via the outlet pressure valve, a first connecting pipe extending in said pressure chamber for supplying fuel to a mixture-former of the engine, said pressure chamber having upper and lower regions, said first connecting pipe having an open lower end disposed in said lower region of the pressure chamber, a second connecting pipe connected to a fuel tank, and a ball valve means in the upper region of said pressure chamber for controlling communication between said pressure chamber and said second connecting pipe, said ball valve means comprising a ball suspended in said upper region of said pressure chamber to rise and fall therein depending on the density of the fluid in the pressure chamber such that when gaseous vapor is formed in said pressure chamber said ball falls and said connecting pipe is opened in said pressure chamber whereas without gaseous vapor, the liquid fuel raises the ball to close communication between the connecting pipe and the pressure chamber.

4,940,398

TWIN-SHAFT, MULTIPLE-STAGE VACUUM PUMP WITH THE SHAFTS VERTICALLY DISPOSED

Hanns-Peter Berges; Hartmut Kriehn, both of Cologne; Wolfgang Leier, Bergisch Gladbach, and Ralf Steffens, Cologne, all of Fed. Rep. of Germany, assignors to Leybold Aktiengesellschaft, Cologne, Fed. Rep. of Germany

Filed May 13, 1988, Ser. No. 193,659

Claims priority, application European Pat. Off., May 15, 1987, 87107089.2

Int. Cl.[5] F04C *29/00*

U.S. Cl. 417—410 **19 Claims**

16. A twin-shaft vacuum pump having a pump inlet and a pump outlet, comprising:

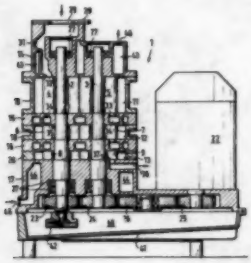
housing means for defining a plurality of pump chambers disposed one above another, and a further chamber beneath the lowermost pump chamber, the pump inlet being disposed higher than the uppermost pump chamber and the pump outlet being disposed lower than the lowermost pump chamber, each pump chamber having a horizontally disposed lower floor with an outlet opening therein, the outlet opening in the lower floor of the lowermost pump chamber communicating with the pump outlet;

a pair of pump shafts;

shaft mounting means for rotatably mounting the pump shafts so that the pump shafts are vertically disposed and extend into the pump chambers and into the further chamber;

a plurality of pairs of rotors, each pair of rotors being disposed in a respective pump chamber and being attached to the shafts;

a drive motor having a motor shaft;



power transmission means for connecting the motor shaft to one of the pump shafts, the power transmission means being disposed below the pump chambers; and

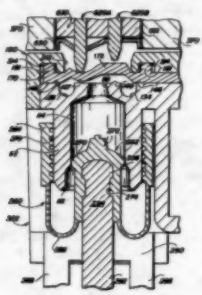
synchronization means in the further chamber for synchronizing the rotation of the pump shafts, the synchronization means including two synchronization gears which are disposed below the pump chambers.

4,940,399

PISTON CAP AND BOOT SEAL FOR A MEDICATION INFUSION SYSTEM

Lanny A. Gorton, Sunland; John P. Pelmulder, Chatsworth; April A. Konopka, and William G. Bloom, both of Northridge, all of Calif., assignors to Pacesetter Infusion, Ltd., Sylmar, Calif.

Filed Dec. 1, 1987, Ser. No. 127,350
Int. Cl.[5] F04B *21/00*
U.S. Cl. 417—415 **20 Claims**



1. A medication infusion pump, comprising:

a pump cylinder having an open end;

an inlet valve for selectively allowing fluid to be admitted to the top of said pump cylinder from a fluid source;

an outlet valve for selectively allowing fluid to be discharged from the top of said pump cylinder to a fluid destination;

a piston which may be selectively driven in a reciprocating motion, one end of said piston being located within said pump cylinder, said one end of said piston located within said pump cylinder having a diameter less than the inner diameter of said pump cylinder, said piston extending from said open end of said pump cylinder;

a piston cap made of resilient material, said piston cap for placement on said one end of said piston, said piston cap being driven by said piston;

an essentially cylindrical retaining skirt for installation around the outer circumference of said pump cylinder;

flexible sealing means extending between said retaining skirt and said piston cap, said sealing means thereby sealing the portion of the interior of said pump cylinder located below said piston cap; and

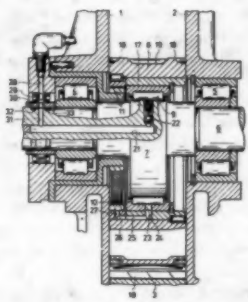
a tortuous path through which gas may pass between said retaining skirt and said pump cylinder from one end of said retaining skirt to the other.

4,940,400

LUBRICATION SYSTEM FOR A ROTARY-PISTON INTERNAL COMBUSTION ENGINE

Josef Speiser, Wasserburg, and Manfred Fischer, Lindau, both of Fed. Rep. of Germany, assignors to Wankel GmbH, Berlin, Fed. Rep. of Germany

Continuation-in-part of Ser. No. 197,857, May 24, 1988, abandoned. This application Aug. 9, 1989, Ser. No. 391,455
Claims priority, application Fed. Rep. of Germany, May 26, 1987, 3717802
Int. Cl.[5] F01C *21/04*
U.S. Cl. 418—61.2 **10 Claims**



1. A rotary-piston internal combustion engine that includes a casing provided with two side parts and a middle housing part with an inner trochoidal surface, as well as an eccentric shaft that passes axially through said casing and supports an eccentric about which a multi-cornered triangular piston free of lubricant oil liquid cooling moves on roller or needle bearings of eccentric bearing means, said piston having sealing parts continually in engagement with the trochoidal surface of the middle housing part and side parts therewith, and with an internal gear of a synchromesh gear mechanism being secured to said piston as well as being provided with a gear space and a gap between the piston and the side part having an adjoining side wall, as well as including a lubrication system of the rotary-piston internal combustion engine for which lubricant oil is supplied via bores in the eccentric shaft and eccentric relative to the eccentric bearing means, the sealing parts and the synchromesh gear mechanism, the improvement therewith comprising:

means forming an axial bore that is provided in said eccentric shaft and that extends to lead only into said eccentric bearing means, said axial bore communicating with at least one first radial bore of said eccentric;

a centrifugal-force-controlled valve means provided in said bore of said eccentric leading up to said eccentric bearing means for metering and dosing of lubricant oil collectively regulated for only restricted lubrication of said eccentric bearing means and of the synchromesh gear mechanism as

necessary so that only such a restricted amount of lubricant oil in a volumetric quantity up to only 100 grams per hour enters the gear space and the gap between the piston and the side part and so that an inside oil seal is eliminated along with a result that only a very small quantity of lubricant oil enters the gap between the adjoining side wall of the casing and the piston; and

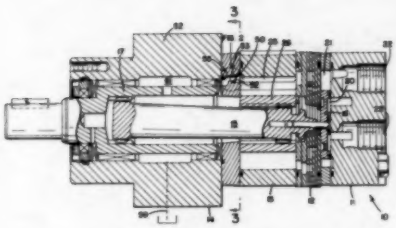
a sealing ring located around said eccentric shaft at an inlet opening for the lubricant oil into the bore in the eccentric shaft, said sealing ring including seal lips that form an annular space with the radial bore aligned with an oil supply line.

4,940,401

LUBRICATION FLUID CIRCULATION USING A PISTON VALVE PUMP WITH BI-DIRECTIONAL FLOW

Hollis N. White, Jr., Hopkinsville, Ky., assignor to White Hydraulics, Inc., Hopkinsville, Ky.

Filed Feb. 14, 1989, Ser. No. 310,778
Int. Cl.[5] F04C 2/10; F03C 2/08
U.S. Cl. 418—61.3 **15 Claims**



1. In a pressure device having a pressure cell subjected to a pressure varying between lower and higher pressures and a drive connection in an internal cavity, the improvement of a piston valve comprising a piston cavity, said piston cavity extending between the pressure cell and the internal cavity, a piston, said piston being movably located within said piston cavity, bypass means for a small amount of fluid to leak past said piston, and said piston moving in said piston cavity to pump fluid bi-directionally into and out of the internal cavity.

4,940,402

HIGH PRESSURE AND HIGH LIFT PUMP IMPELLER

Daniel F. McCormick, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Nov. 8, 1988, Ser. No. 268,749
Int. Cl.[5] F04C 5/00
U.S. Cl. 418—154 **2 Claims**

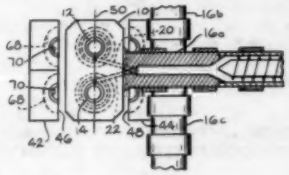
1. A pump impeller for a rotary vane positive displacement pump having a pump driveshaft extending axially through a pump housing having a circumferential sidewall defining a pumping chamber, said impeller comprising an annular hub portion driven by said driveshaft and a plurality of flexible vanes extending radially outwardly therefrom in said chamber and having outer tips engaging said sidewall, said impeller also comprising a plurality of filler blades extending radially outwardly from said hub portion between respective said vanes and occupying space therebetween and displacing volume in said chamber, said vanes moving through portions of varying flexure during rotation of said driveshaft, said filler blades being spaced radially inwardly of said sidewall and out of engagement therewith at all times and defining radial gaps therebetween, the radial width of which vary during rotary travel between a portion of largest radial ga at a portion of least flexure of the adjacent vane, and a portion of least redial gap at the portion of greatest flexure of the adjacent vane, the pumping volume of said chamber being along the inner periphery of said sidewall between said sidewall and said filler blades, the inner volume otherwise radially inward of said pumping volume being substantially displaced by said filler blades, said filler blades have an outer edge substantially adjacent said sidewall but always spaced therefrom by a gap therebetween including when the adjacent vane is at maximum flexure, said filler blades having a leading edge accommodating flexure of the respective vane during greatest flexure thereof and conforming to the profile of said outer tip of said vane and always providing a gap therebetween including when the vane is at maximum flexure.

4,940,403

DUAL PARISON EXTRUSION HEAD FOR MULTI-LAYER BLOW MOLDING

Michael Hirschberger, Sylvania, Ohio, assignor to Hoover Universal, Inc., Ann Arbor, Mich.

Filed May 1, 1989, Ser. No. 345,566
Int. Cl.[5] B29C 47/26
U.S. Cl. 425—133.1 **12 Claims**



1. An extrusion head for continuously producing dual parisons of plastic resin for blow molding plastic articles, comprising:

a single die body;

means within said die body for forming two parallel cylindrical resin flow passages each having an upright longitudinal axis, said cylindrical passages each having an open lower end forming an annular outlet orifice;

resin supply means within said die body for directing plastic resin into said cylindrical passages to form a longitudinally flowing resin body within each said cylindrical passage; and

said resin supply means including a resin inlet, a pair of resin feed tubes through which resin flows from said inlet toward said cylindrical passages, said pair of tubes being symmetrical with respect to one another about a vertical plane bisecting said die body between said cylindrical passages, said tubes terminating at ends opposite said inlet which are located on a vertical plane containing the longitudinal axes of said cylindrical passages and an annular chamber concentric about each of said cylindrical passages and spaced vertically downstream from said feed tubes, said chambers being in communication with the terminal ends of said feed tubes so that resin flows vertically from said feed tubes into said annular chambers and flows through said chambers in circumferentially opposite

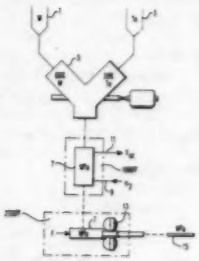
directions joining together diametrically opposite from said feed tube terminal ends at locations on said vertical plane containing the axes of said cylindrical passages.

4,940,404

METHOD OF MAKING A HIGH VELOCITY ARMOR PENETRATOR

Robert L. Ammon, Baldwin; Raymond W. Buckman, Jr., Pleasant Hills, and Ram Bajaj, Greensburg, all of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1989, Ser. No. 337,604
Int. Cl.[5] B22F *3/24*
U.S. Cl. 419—28 **9 Claims**



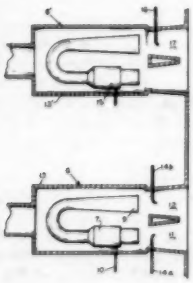
1. A method of making a high velocity armor penetrator material comprising the steps of:
blending powdered tungsten and powdered tantalum;
encapsulating the blended powder in a metal canister;
degassing the blended powder in the canister at an elevated temperature by evacuation;
sealing the evacuated canister; and
extruding the canister through dies at a higher elevated temperature to produce a metal clad bar of fully dense tungsten - tantalum.

4,940,405

PULSE COMBUSTION DRIVEN IN-FURNACE NOX AND SO2 CONTROL SYSTEM FOR FURNACES AND BOILERS

John T. Kelly, 109 Via De Tesoros, Los Gatos, Calif. 95030

Filed Feb. 23, 1989, Ser. No. 313,841
Int. Cl.[5] F23C *11/04*
U.S. Cl. 431—1 **8 Claims**



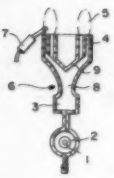
1. Apparatus for reducing the emission of NOx in a boiler or furnace system having a primary combustion chamber from which combustion products are directed upwardly along a path leading to an exhaust stack, the apparatus comprising the combination of first pulse combustor means for combusting a fuel with air in successive explosive pulses of hot combustion gases, means for entraining additional air with the pulses, means for injecting and mixing pulverized coal with the pulses and additional air, means for directing the mixture of coal, pulses and additional air into a first zone along said path for mixture with the combustion products, with fuel NOx in the combustion products being substantially reduced to molecular nitrogen by chemical reaction in the zone.

4,940,406

INCOMPLETE COMBUSTION PREVENTING GAS BURNER

Heu-Tae Kee, Seoul, Rep. of Korea, assignor to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea

Filed Aug. 4, 1989, Ser. No. 389,811
Claims priority, application Rep. of Korea, Dec. 14, 1988, 88 20625
Int. Cl.[5] F23N *5/00*
U.S. Cl. 431—22 **14 Claims**



1. An incomplete combustion preventing gas burner which includes a mixing room for mixing air and gas, flame holes for spouting the air-gas mixture, and a thermo-electric couple installed in the vicinity of the said flame holes in order to open/close a combustible gas supply cock in accordance with the thermal interactions between the said flame and the said thermo-electric couple,
the improvement comprising:
means forming a venturi located between said mixing room and said flame holes; and
a V-shaped guide portion extending into said venturi means and further restricting the flow of air and gas to said flame holes so that a mixture of air and gas is spouted from said flame holes at high velocity.

4,940,407

GAS-FIRED FIREPLACE LOG SET

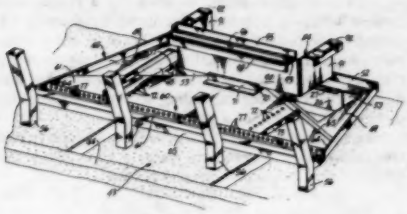
Thomas R. Rehberg, Orange, and Sam Brailoff, Whittier, both of Calif., assignors to Mobex Corporation, Fullerton, Calif.

Continuation-in-part of Ser. No. 144,411, Jan. 15, 1988, abandoned. This application Nov. 6, 1989, Ser. No. 346,779
Int. Cl.[5] F23Q *2/32*
U.S. Cl. 431—126 **1 Claim**

1. A gas log assembly for a fireplace, comprising:
a base;
a burner assembly supported on the base and defining a gas plenum, the plenum having a generally centrally positioned main jet, a pair of lateral jet arrays on opposite sides of the main jet to extend fore-and-aft when the gas log assembly is positioned in the fireplace, and a linear array of underlog jets extending across the front of the plenum;
the burner assembly further including a flame-spreader assembly extending above the main jet, a first flame-coloration means on the flame-spreader assembly, and a second flame-coloration means supported adjacent and extending along the underlog jets;

an artificial log supported on the flame-spreader assembly; and

means for supplying gas to the plenum;



the flame-coloration means being effective to change flame coloration of ignited gas issuing from the jets from blue to yellow-orange.

4,940,408

TUNNEL KILN

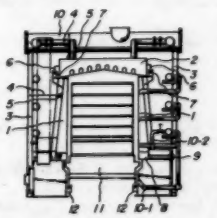
Koji Ogura, Chiryu, and Kazuhiro Miyahara, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed May 16, 1989, Ser. No. 352,243

Claims priority, application Japan, May 30, 1988, 63-70421[U]

Int. Cl.[5] F27B 9/26

U.S. Cl. 432—137 **6 Claims**



1. A tunnel kiln for firing molded ceramic green products having a gate for kiln cars, said gate comprising: steel side walls having exhaust ports passing therethrough; a steel ceiling disposed between the side walls and inclined downwardly toward the side walls; sand seals between the side walls and the kiln cars in said tunnel kiln; and receiving bases provided at a lower end of the side walls for receiving decomposed products, said receiving bases communicating with an outside of the kiln through said exhaust ports.

4,940,409

METHOD AND APPARATUS FOR MAKING DENTAL JAW MODELS

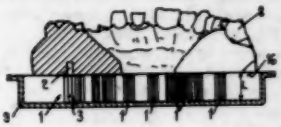
Harald E. Nordin, Villa Amphion, CH-1822 Chernex, Switzerland

Continuation of Ser. No. 30,031, Mar. 25, 1987, abandoned. This application Sep. 20, 1989, Ser. No. 410,024

Claims priority, application European Pat. Off., Mar. 27, 1986, 86810149.4

Int. Cl.[5] A61C 19/00

U.S. Cl. 433—74 **17 Claims**



1. A pin for use in a tooth and jaw model for removably attaching a jaw replica positive severed into a plurality of sections to a base comprising;

a generally cylindrical first axial portion; and

a second axial portion of generally constant cross-sectional shape and area, containing a plurality of prongs extending the length of said second axial portion, each prong comprising a plurality of planar faces of which at least two are parallel.

4,940,410

DENTAL TOOL HOLDER

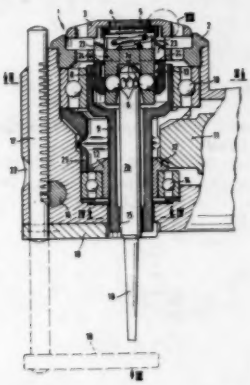
Marc F. C. Apap, Montrouge; Cedric L. M. C. Thorin, Paris, both of France; Otto Rosenstatter, Seeham, and Peter Malata, Bürmoos, both of Austria, assignors to Dentalwerk Bürmoos Gesellschaft m.b.H., Bürmoos, Austria

Filed Aug. 24, 1988, Ser. No. 235,649

Claims priority, application Austria, Aug. 24, 1987, 2108/87

Int. Cl.[5] A61C 5/02

U.S. Cl. 433—102 **10 Claims**



1. A dental toolholder apparatus in combination with and for holding an endodontic filing tool having a filing end for filing tooth material, and a shaft connected to the filing end, the apparatus comprising a toolholder housing, a drive sleeve mounted for rotation to said toolholder housing, said drive sleeve having a borehole therethrough for engaging a lower end of the tool shaft for rotating and oscillating the tool, said borehole having a cross section taken transversely to the axis of the filing tool which has a constant-drive configuration for

rotating the tool while permitting swinging movement of the tool, clamping means connected to the housing for clamping an upper end of the tool shaft against axial movement to the housing while permitting swinging movement and rotation of the tool, and drive means operatively connected to said drive sleeve for rotating said drive sleeve.

4,940,411

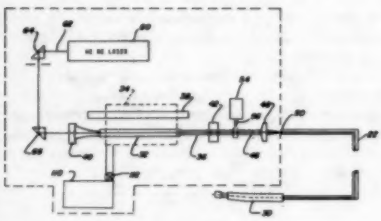
DENTAL LASER METHOD

Arthur Vassiliadis; Joseph W. Shaffer, both of Mountain View; David J. Fullmer, Foster City; Michael H. Brewer, Felton; David R. Hennings, Newcastle, all of Calif., and Terry D. Myers, Farmington Hills, Mich., assignors to American Dental Laser, Inc., Birmingham, Mich.

Continuation-in-part of Ser. No. 236,450, Aug. 25, 1988. This application Apr. 24, 1989, Ser. No. 342,190

Int. Cl.[5] A61C *5/00*

U.S. Cl. 433—215 **8 Claims**



1. A method for performing a root canal procedure on a tooth, said tooth having a pulp chamber, comprising the steps of:

opening a hole in said tooth to said pulp chamber,

aiming a pulsed laser so that the output from the laser impinges upon pulp contained within the pulp chamber,

repeatedly activating the laser until the pulp in the pulp chamber is eradicated,

wherein said laser has an energy output per pulse sufficient to both eradicate pulp contained in the pulp chamber and to sterilize the pulp chamber.

4,940,412

METHOD OF MANUFACTURING ANATOMICAL MODELS

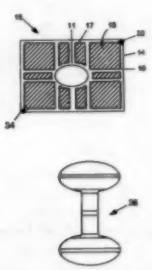
Rafael Blumenthal, Kiryat Tivon, Israel, assignor to Elscint Ltd., Haifa, Israel

Filed Dec. 2, 1988, Ser. No. 279,121

Claims priority, application Israel, Dec. 8, 1987, 84752

Int. Cl.[5] G09B *23/28*

U.S. Cl. 434—267 **8 Claims**



1. A method for manufacturing three-dimensional anatomical models for use in surgical planning and the like, said method comprising the steps of:

acquiring a series of tomographic hard copy images of cross section of desired portions of anatomy of a patient, said images having transparent and opaque portions,

using said hard copy images as masks in a photographic process wherein layers are produced by passing light through transparent portions of the hard copy images onto photosensitive material whereby the photosensitive material is hardened in areas where the light passes through to depict corresponding sections of the desired portions of anatomy of a patient, and

attaching said layers of light hardened photosensitive material contigiously together to form a three-dimensional model of said desired anatomical section.

4,940,413

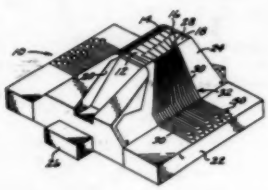
ELECTRICAL MAKE/BREAK INTERCONNECT HAVING HIGH TRACE DENSITY

Winthrop D. Childers, San Diego, and William Sperry, Poway, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Jul. 26, 1989, Ser. No. 385,615

Int. Cl.[5] H01R *9/09*

U.S. Cl. 439—67 **26 Claims**



1. An article in which two sets of mutually coplanar parallel conductor traces are connected together, comprising:

a first set of coplanar parallel conductor traces extending from a device toward an external connection;

a second set of coplanar parallel conductor traces extending toward the device from an external connection, and being mutually coplanar with the first set of conductor traces, at least one set of the first and second sets of conductor traces having an enlarged contact pad at the end of each trace, the width of at least some of the pads being greater than the spacing between the conductor traces, at least some of the pads being spaced at different distances from the device, and the two sets of traces having respective facing surfaces disposed in a facing relationship to each other; and

means for releasably contacting the respective facing surfaces together.

4,940,414

ANTITHEFT CAR AUDIO SET WITH REMOVABLE CONTROL BOX

Jong D. Lee, Kyungki-Do, Rep. of Korea, assignor to Namsung Electronics Corp., Rep. of Korea

Filed Apr. 28, 1989, Ser. No. 345,094

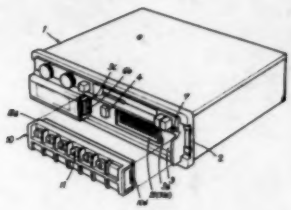
Claims priority, application Rep. of Korea, Sep. 20, 1988, 15432/1988[U]

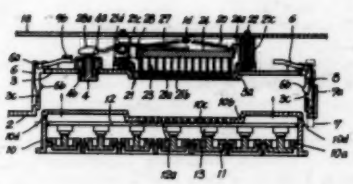
Int. Cl.[5] H01R *13/627, 13/44*

U.S. Cl. 439—131 **7 Claims**

1. A separating apparatus for a control box of a car audio set, comprising: a housing body, a face plate having a concave well, a main frame having a tension spring hanging on the inner wall thereof, a contact block assembly positioned between said face plate and said frame, and a control box which is separable from said face plate, said control box being receivable in and

detachable from said concave well of said face plate, said control box comprising a housing having a number of longitudinal slots on the rear face thereof, a plurality of switches and a circuit board connected to said switches, said circuit board having a number of contact members which are engageable through said longitudinal slots, said concave well of said face plate having a longitudinal slot, said contact block assembly comprising a contact block and a contact block frame, said contact block having a plurality of contact pins provided forwardly thereof, said contact block frame having a forwardly protruding portion having a number of longitudinal slots communicating with said longitudinal slots of said control box for receiving said contact pins of said contact block and two opposite bosses through which said main frame and said contact block frame are connected, said tension spring being provided between said main frame and said contact block for biasing said contact block toward the inner wall of said main frame, said contact pins, when moved forward against the bias of the tension spring, contacting said contact members of said circuit board.





4,940,415

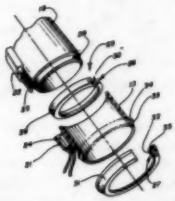
KEY SYSTEM FOR VACUUM CLEANER HOSE CONNECTION

George A. Westergren, Linwood Township, Anoka County, Minn., assignor to Whirlpool Corporation, Benton Harbor, Mich.

Continuation of Ser. No. 55,371, May 29, 1987, abandoned. This application Sep. 20, 1988, Ser. No. 248,256

Int. Cl.[5] H01R *4/60*

U.S. Cl. 439—192 13 Claims



1. In a vacuum cleaner structure having a canister provided with a first hose connector defining a cylindrical suction inlet and a suction hose provided with a tubular end portion defining a second hose connector, said first and second hose connectors configured to be assembled into coaxial operative relationship, one within the other, by effecting relative axial movement of said first and second hose connectors, the improvement comprising:

a first male electrical connector;

a first male electrical connector complementary to said first male electrical connector;

means for attaching one of said first male and female electrical connectors to one of the first and second hose connectors and the other of the first male and female electrical connectors to the other of the first and second hose connectors so that the first male electrical connector is electrically connected to the first female electrical connector as an incident of the first and second hose connectors being moved axially relative to each other into their operative relationship;

a second male electrical connector;

a second female electrical connector complementary to said second male electrical connector;

means for attaching one of said second male and female electrical connectors to one of the first and second hose connectors and the other of the second male and female electrical connectors to the other of the first and second hose connectors so that the second male electrical connector is electrically connected to the second female electrical connector as an incident of the first and second hose connectors being moved axially relative to each other into their operative relationship;

complementary first annular lock and key elements indicative of said first male and female electrical connectors for mounting one each to said first and second hose connectors with the first male and female electrical connectors attached to said first and second hose connectors and for permitting movement of the first and second hose connectors into operative relationship and concurrently electrical connection of the first male and female electrical connectors; and

complementary second annular lock and key elements, both being different than the corresponding first annular lock and key elements, indicative of said second male and female electrical connectors, for mounting one each to said first and second hose connectors with the second male and female electrical connectors attached to said first and second hose connectors and for permitting movement of the first and second hose connectors into operative relationship and concurrently electrical connection of the second male and female electrical connectors,

said first and second complementary annular lock and key elements further including cooperating means for preventing movement of the first and second hose connectors into operative relationship with (1) the first male electrical connector on one of the first and second hose connectors and the second female electrical connector on the other of the first and second hose connectors and (2) the second male connector on one of the first and second hose connectors and the first female electrical connector on the other of the first and second hose connectors and thereby inadvertent electrical connection of the first male connector to the second female connector and the second male connector to the first female connector.

4,940,416

PRESSURE COMPENSATING CONNECTOR ASSEMBLY

James P. Wagaman, and Neil B. Karlskind, both of 9450 Cozycroft Ave., Chatsworth, Calif. 91311

Filed Jun. 16, 1989, Ser. No. 367,419

Int. Cl.[5] H01R *13/523*

U.S. Cl. 439—204 2 Claims

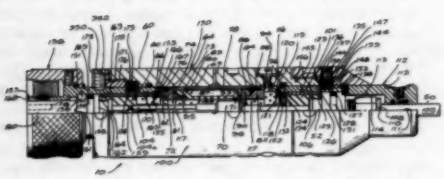
1. A pressure compensation apparatus for a connector assembly with at least one coupling member comprising a hous-

ing with a cable receiving end having a cable receiving orifice therethrough, an interface end with an insert member therein configured to mate with another coupling member, and first means positioned in the cable receiving orifice whereby the cable, comprising at least one wire, extends through the first means, the housing defining a circumferential chamber with a circumferential surface extending between the first means and the insert member, the cable extending through the chamber to couple to the insert member, the chamber having disposed therein a substantially incompressible non-electrically conducting fluid, the pressure compensation apparatus for equalizing the pressure between the inside of the chamber and the outside environment while preventing fluid communication between the chamber and the outside environment comprising:

a cylindrical sealing sleeve positioned in the chamber against the circumferential surface of the chamber;

a first cylindrical mating sleeve positioned in the sealing sleeve and having a first surface for sealing contact against the circumferential surface of the sealing sleeve and a second surface spaced inwardly from the circumferential surface of the sealing sleeve for providing a space between the second surface and the circumferential surface of the sealing sleeve, the second surface having a first circumferential locator nib protruding radially therefrom toward the circumferential surface of the sealing sleeve;

a second cylindrical mating sleeve positioned in the sealing sleeve in spaced relationship to the first mating sleeve, the



second mating sleeve having a third surface for sealing contact against the circumferential surface of the sealing sleeve and a fourth surface spaced inwardly from the circumferential surface of the sealing sleeve for providing a space between the fourth surface and the circumferential surface of the sealing sleeve, the fourth surface having a second circumferential locator nib protruding radially therefrom toward the circumferential surface of the sealing sleeve;

an elastomeric boot having a first end sized to stretch fit over the second surface of the first mating sleeve and having a second end sized to stretch fit over the fourth surface of the second mating sleeve to thereby bifurcate the chamber into an interior region inside the boot and an exterior region radially between the boot and the surface of the sealing sleeve and longitudinally between the first surface and the third surface;

the chamber housing having a pressure equalizing orifice therethrough at a location whereby exterior region of the chamber communicates with the environment outside the connector, the incompressible fluid being confined to the interior region of the chamber;

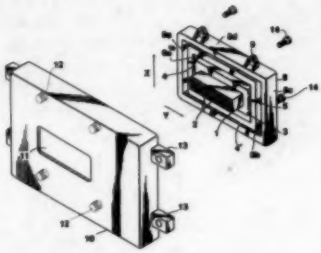
the sealing sleeve having a pressure equalizing orifice therethrough at a location whereby the exterior region of the chamber communicates with the environment outside the connector, the incompressible fluid being confined to the interior region of the chamber.

4,940,417

CONNECTOR DEVICE WITH FITTING ADJUSTMENT MECHANISM

Yukihiro Hyogo, and Akio Kurihara, both of Shizuoka, Japan, assignors to Yazaki Corporation, Japan

Filed Jun. 23, 1989, Ser. No. 370,887
Claims priority, application Japan, Jun. 24, 1988, 63-83008[U]
Int. Cl.[5] H01R *13/631*
U.S. Cl. 439—248 **9 Claims**



1. A connector device with a mating adjustment mechanism, which comprises:

a connector adapted to mate with a mating connector;

a first frame which surrounds the connector;

a second frame which surrounds the first frame;

first means for enabling step-by-step displacement of the connector with respect to the first frame along an X or Y direction within a plane substantially perpendicular to the mating direction of the connectors; and

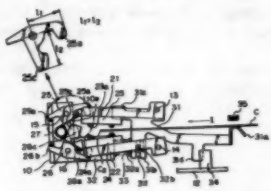
second means for enabling step-by-step displacement of the first frame with respect to the second frame along the direction perpendicular to the displaceable direction of the connector with respect to the first frame within said plane.

4,940,418

CARD READ/WRITE DEVICE

Makoto Shimizu, and Hiroshi Konishi, both of Tokyo, Japan, assignors to OKI Electric Industry Co., Ltd., Tokyo, Japan

Filed Apr. 20, 1989, Ser. No. 340,933
Claims priority, application Japan, Apr. 21, 1988, 63-98765
Int. Cl.[5] H01R *13/15*
U.S. Cl. 439—260 **6 Claims**



1. A card read/write device comprising:

a frame;

a disconnection mechanism rotatably mounted on said frame, said disconnection mechanism comprising contact members opposed to each other and respectively having electrode terminals capable of contacting electrodes mounted on a card, and transfer levers having respectively at least two projections, one of said projections urging said contact members toward the side of the card for allowing the electrode terminals of said contact mem-

bers to contact said electrodes of the card when a tip end of the card inserted into the frame is pushed to another of said projections, and

a first spring positioned at rear ends of said contact members and between said transfer levers for urging said contact members in a direction to move away from the card,

wherein the following expression is established:

$$L1 > L2$$

where L1 is a distance from a rotative fulcrum of said contact members to an operation point of the force for urging said contact members toward the side of the card by said transfer levers, and L2 is a distance from the rotative fulcrum of said contact members to the operating point of a resultant force for receiving the force from the card by said electrode terminals.

4,940,419

ELECTRICAL JUNCTION BOX

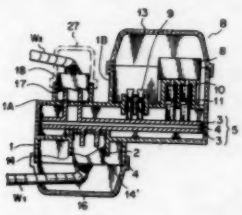
Kaoru Kurita, and Yukio Nishio, both of Shizuoka, Japan, assignors to Yazaki Corporation, Tokyo, Japan

Filed Mar. 24, 1989, Ser. No. 328,390

Claims priority, application Japan, Mar. 25, 1988, 63-38427[U]

Int. Cl.[5] H01R *4/00*

U.S. Cl. 439—271 **3 Claims**



1. A waterproof electrical junction box having upper and lower surfaces that comprises:

a first connector receiving portion provided on the upper surface and adapted for receiving a waterproof connector;

a second connector receiving portion provided on the lower surface and adapted for receiving a lower connector, wherein said second connector receiving portion includes a connector cover engageably mounted to said second connector receiving portion for covering said second connector receiving portion and said lower connector when said second connector receiving portion and said lower connector are engaged; and

a waterproof connector operatively connected to a wire harness and adapted for being connected into said first connector receiving portion wherein said waterproof connector includes

an insulating housing having terminal receiving chambers defined therein, said insulating housing also having an outer peripheral groove formed on an outer periphery thereof,

a seal packing placed in said outer peripheral groove for providing a waterproof seal between said insulating housing and said first connector receiving portion when connected, and

waterproof rubber plugs connected to wires with terminals from said wire harness for connecting and waterproof sealing the wires and terminals into the said terminal receiving chambers of said insulating housing.

4,940,420

ELECTRICAL CONNECTOR WITH RETAINED BOOT

Richard T. Munie, Dearborn Heights, Mich., assignor to Ford Motor Company, Dearborn, Mich.

Filed Aug. 17, 1989, Ser. No. 394,903

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—272 **7 Claims**

1. A sealed electrical connector having a longitudinal insertion axis, comprising:

a first connector member having a front face, a plurality of first electrical contacts extending parallel to said longitudinal axis and meeting said front face, and a shroud extending from said front face annularly of said longitudinal axis, an inner wall of said shroud having a substantially oval shape as viewed in cross section perpendicular to said longitudinal axis;

a sealing boot received within said shroud, said sealing boot formed to have a substantially circular shape as viewed in cross section perpendicular to said longitudinal axis, said sealing boot having an outer cylindrical surface deformed by said shroud into a substantially oval shape conforming to said inner wall of said shroud; and

a second connector member having a plurality of second electrical contacts extending parallel to said longitudinal axis and contacting said first electrical contacts, said second connector member having a substantially oval-shaped perimeter engaging an inner cylindrical surface of said sealing boot.

4,940,421

WATER-PROOF ELECTRICAL CONNECTOR

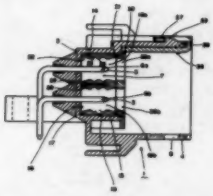
Kouji Kano, Tokyo; Sumitaka Ogawa, Wako; Minoru Sano, Yamato, and Masahiro Sakano, Yokohama, all of Japan, assignors to Molex Incorporated, Lisle, Ill.

Filed Jul. 19, 1989, Ser. No. 381,877

Claims priority, application Japan, Jul. 19, 1988, 63-95331[U]

Int. Cl.[5] H01R *13/52*

U.S. Cl. 439—273 **3 Claims**



1. A waterproof type of electric connector comprising a male half (2) and a female half (1), said male half (2) including a plug housing (9) having a plurality of contact pieces (10*a*, 10*b*) detachably fitted therein, said female half (1) including a socket housing (5) having a cavity (7) to detachably accept said plug housing (9), a plurality of pin terminals (6*a*, 6*b*) fixed to the bottom of said cavity in such an arrangement that the pin terminals (6*a*, 6*b*) mate with corresponding contact pieces (10*a*, 10*b*) when said male half (2) is inserted in said cavity (7) of said

female half (1), and a seal member placed in the space which is to be formed between the outer surface of said plug housing (9) and the inside surface of said socket housing (5) when said male and female halves (2) and (1) are coupled, thereby preventing water from invading the inside of the electric connector, characterized in that said plug housing (9) has a plurality of hollow protrusions each having a cylindrical cell (13*a*, 13*b*) to permit each of said contact pieces (10*a*, 10*b*) to fit in, said seal member (14) encircling each of said protrusions, thereby sealing each pin-and-contact piece connection independently from adjacent pin-and-contact piece connection said seal member (14) being made of a unitary structure, which has a front surface (17), a rear surface (31), a circumferential side (15) connecting the front and rear surfaces, and a plurality of through holes each permitting a corresponding protrusion to enter therein, said seal member being placed with its front surface (17) on the bottom (18) of said cavity (7) and with its circumferential side (15) on the inside circumference (16) of said cavity (7), each of said through holes having hills (24) and valleys (23) alternately formed on its inside surface (22), the hills (24) of each through hole being pressed against the outer surface of a corresponding protrusion.

4,940,422

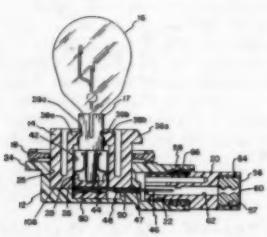
LOW PROFILE LAMP SOCKET ASSEMBLY

John A. Forish, Fort Wayne, and John J. Rogers, Huntertown, both of Ind., assignors to Zanxx, Inc., Avilla, Ind.

Filed May 17, 1989, Ser. No. 352,965

Int. Cl.[5] H01R *33/09*

U.S. Cl. 439—356 **22 Claims**



1. A lamp socket assembly comprising:

a housing, said housing including a first cavity;

a body received in said first cavity, said body including a plurality of camming lugs for retaining said lamp socket assembly in a mounted position in an apertured panel, said body further including a through passage for receiving a lamp base therein and means for retaining said lamp base in said through passage;

a contact insert received in said first cavity, said contact insert including a groove for receiving said lamp base therein, said contact insert including means for receiving and retaining a plurality of contacts; and

a plurality of blade terminals interlocked with said contact insert, respective said contacts, and said housing.

4,940,423

CONNECTOR APPARATUS

Yasuyuki Aihara; Hideki Kano; Yoshikazu Tsuchiya, and Noboru Miyazaki, all of Tochigi, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

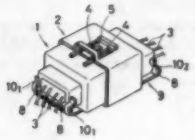
Filed Dec. 15, 1988, Ser. No. 284,985

Claims priority, application Japan, Dec. 15, 1987, 62-189393[U]

Int. Cl.[5] H01R *13/02*

U.S. Cl. 439—369 **4 Claims**

1. A connector apparatus comprising male and female connector members and a stay for mounting the connector members in place, a pair of oblong projections formed on a terminal block portion at a rear end of each connector member as to be located at both outer sides with respect to a lead wire outlet section of said terminal block portion, each said oblong projection comprising a pin which projects outwardly from said terminal block, and a pair of first elastic hook pieces provided on said stay engageable with said pair of oblong projections of the male connector member and a pair of second elastic hook pieces provided on said stay engageable with said pair of oblong projections of the female connector member, said first



and second elastic hook pieces being arranged to face each other with a space therebetween measuring approximately equal to the distance between the respective terminal block portions of the two connector members when the connector members are completely assembled to each other; wherein each pair of said first and second elastic hook pieces are so formed and spaced that inner side edges of top-end portions thereof contact surfaces of opposite side walls of each terminal block portion; wherein each of said elastic hook pieces is so shaped as to look like a letter S when viewed from the side.

4,940,424

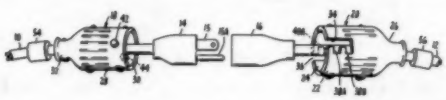
ELECTRICAL PLUG ACCESSORY

Larry E. Odbert, 11179 Jackson Rd., Sacramento, Calif. 95830

Filed May 5, 1989, Ser. No. 348,194

Int. Cl.[5] H01R *13/62*

U.S. Cl. 439—369 **5 Claims**



1. A device for holding together a male plug and a female plug of an electrical connector in a connected state, each of the male and female plugs having a plug body and an electrical cord extending therefrom, said device comprising:

male and female members of substantially cylindrical hollow configuration, each of the member having an open end adapted to receive one of the male and the female plugs and enclose and surround said one of the male and female plugs while presenting an open end through which the surrounded male or female plug can fully protrude and be accessed and an enclosed end shaped to engage and abut its inner surface against the body of the plug it surrounds and to provide an aperture through which the electrical cord can extend and move so as to permit the male or female plug to move relative to the member and to fully protrude from the member and be grasped for connection and disconnection;

the male hollow member having an exterior cylindrical surface which fits within the interior cylindrical surface of the female hollow member, one of the two cylindrical surfaces carrying one or more axial indentations each having one more indented notches in communication with and perpendicular to the axial indentations, the other of the two cylindrical surfaces carrying one or more protuberances, the number, size and location of the protuberances corresponding to the axial indentations on the other surface, said protuberances positioned so as to engage the

axial indentations and to meet the perpendicular notches when the inner surfaces of the male and female members abut against the bodies of the male and female plugs in a connected state so that upon rotation of the male and female members relative to one another, the protuberances enter and engage the notches thereby locking the two members in position holding together the male plug and the female plug in a connected state.

4,940,425

ELECTRICAL CONTACT MEMBER

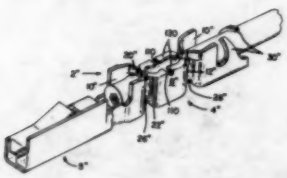
Juergen Hass, Erzhausen, and Gheorghe Hotea, Griesheim, both of Fed. Rep. of Germany, assignors to AMP Incorporated, Harrisburg, Pa.

Filed Jul. 25, 1989, Ser. No. 385,609

Claims priority, application United Kingdom, Jul. 26, 1988, 8817783

Int. Cl.[5] H01R *4/24*

U.S. Cl. 439—397 **7 Claims**



1. A one-piece stamped and formed electrical contact member for making permanent electrical contact with the metal core of an insulated electrical lead, the contact member, which is of substantially U-shaped cross section, comprising a base and spaced side walls extending in the same direction, each from an opposite edge of the base to define a lead receiving channel, opposed portions of the side walls being bowed towards each other inwardly of the channel to define a core-receiving slot extending substantially normally of said base, and each bowed portion being surmounted by a pair of insulation severing surfaces converging towards each other inwardly of the channel and being inclined towards the base; characterized in that each insulation severing surface of said pair of insulation severing surfaces of each bowed portion is defined by a lead hold-down wing extending from the respective side wall and being divided from said inwardly bowed portion, the wings of said pair converging from said side wall towards the center line of the channel and being plastically deformable relative to said inwardly bowed portion to overlie the electrical lead.

4,940,426

HIGH DENSITY WOVEN WIRE HARNESS ASSEMBLY

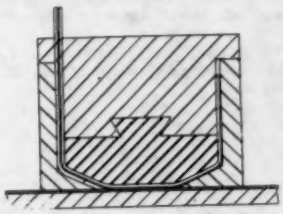
John P. Redmond, Mechanicsburg, and Ray N. Shaak, Lebanon, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Aug. 8, 1989, Ser. No. 390,793

Int. Cl.[5] H01R *9/07*

U.S. Cl. 439—495 **11 Claims**

1. A high density electrical connector assembly comprising a woven fabric formed of a plurality of parallel, electrically conductive wires of a discrete length forming the warp wires, where said warp wires have a small, uniform centerline spacing between adjacent warp wires, and a plurality of insulative woof filaments, an encapsulating film on one major flat side of said fabric to space and retain said parallel relationship, and a comparable encapsulating film on the opposite major face thereof, except that said conductive wires are exposed at the ends along a portion of the lengths to provide connector



contacts, and a pair of end housings for electrically mating said exposed portions to a high density electrical circuit pattern.

4,940,427

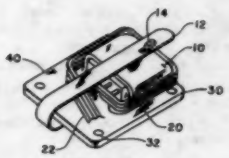
ELECTRICAL TRAILER CONNECTOR RETAINER

Linnea H. Pearson, 249 E. Baker St., St. Paul, Minn. 55107

Filed Sep. 18, 1989, Ser. No. 408,520

Int. Cl.[5] H01R *13/60*

U.S. Cl. 439—501 **2 Claims**



1. A retainer for securing a plug and a plurality of electrical conductors operatively connected to the plug said electrical conductors being operatively associated with the electrical system of a vehicle, said retainer comprising, in combination:

a base plate;

a plug receiving means mounted on the base plate for receiving an electrical plug inserted therein, said plug receiving means being constructed and arranged for supporting the excess length of electrical conductors projecting from the plug when the conductors are wound around the plug receiving means; and

strap means affixed to the base constructed and arranged for releasable attachment to the plug receiving means for releasably retaining the electrical conductors wrapped around the plug receiving means.

4,940,428

ELECTRICAL CONNECTOR WITH RESILIENT RETAINING MEANS

Werner Heidotting, Munster; Wolfgang Scheffner, Roedermark, and Willi Duerkop, Reinheim, all of Fed. Rep. of Germany, assignors to C. A. Weidmueller GmbH & Co., Detmold, Fed. Rep. of Germany

Filed Mar. 22, 1989, Ser. No. 327,091

Claims priority, application European Pat. Off., Mar. 26, 1988, 88104898-7

Int. Cl.[5] H01R *13/40*

U.S. Cl. 439—598 **10 Claims**

1. Electrical connector apparatus, comprising:

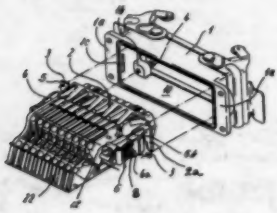
(a) a base member (1) having front and rear walls, said base member containing a through opening (10) extending between said front and rear walls;

(b) a connector member (2) having a forward end adapted

for progressive insertion within said base member opening in the direction from said rear wall toward said front wall;

(c) resilient snap fastener means operable upon insertion of said connector member to a given position within said opening relative to said base member for automatically connecting said connector member with said base member; and

(d) means (4) operable from the front of said base member for rigidly connecting said connector with said base member;



(e) said resilient snap fastener means including at least two resiliently outwardly-biased hook members (6) arranged on opposite sides of said connector member for engagement with corresponding retaining shoulders (1c) on said base member adjacent opposite sides of said opening, respectively, thereby to prevent withdrawal of said connector member from said opening;

(f) said hook members including means (8) arranged rearwardly of said base member rear wall for compressing said hook members to disengage the same from said base member, thereby to permit removal of said connector member from said opening.

4,940,429

REMOVABLE FILTER ARRAY FOR MULTI-WAY CONNECTORS

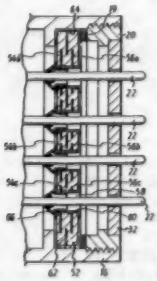
Jeffrey Chambers; Trevor Armistead, and John C. Frodsham, all of Ulverston, England, assignors to Oxley Developments Company Limited, London, England

Filed Apr. 14, 1989, Ser. No. 338,724

Claims priority, application United Kingdom, Apr. 26, 1988, 8809854

Int. Cl.[5] H01R *23/06*

U.S. Cl. 439—608 13 Claims



1. In a multi-way connector assembly comprising a tubular metal outer casing and a plurality of electrical lead-through terminations which extend through the outer casing, the terminations carrying respective annular discoidal filter capacitors whose outer electrodes are connected electrically to a ground plane in the form of a metal plate which is itself connected electrically to the outer metal casing, the improvement wherein the inner electrodes of the capacitors are electrically coupled to the associated lead-through terminations by respective contact clips and which are adapted to enable relative displacement of the capacitors and terminations for purposes of assembly and disassembly and wherein the metal plate forming the ground plane is held in electrical connection with the outer casing by means of a removable locking means.

4,940,430

ELECTRICAL CONNECTOR WITH OPENABLE COVER

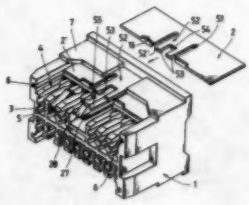
Mitsuhiro Fujitani; Hiroyuki Oka, both of Mie, and Seiji Hirano, Hiroshima, all of Japan, assignors to Sumitomo Wiring Systems, Ltd., Yokkaichi, Japan

Filed Jan. 31, 1989, Ser. No. 304,287

Claims priority, application Japan, Feb. 1, 1988, 63-12650[U]; Feb. 1, 1988, 63-12651

Int. Cl.[5] H01R *13/502*

U.S. Cl. 439—686 2 Claims



1. An electrical connector, comprising:

a connector housing having an upper wall with a front portion of said upper wall removed to provide an opening and a peep notch formed into the front edge of said upper wall;

tongues of terminals disposed in said housing and exposed at said opening;

a cover slidably mounted so as to be able to slide open to reveal said upper wall opening and to slide closed to hide said upper wall opening and reveal a peep gap between a rear edge of said cover and said front edge of said upper wall as a result of said peep notch; and

a cover retainer mechanism comprising,

an angular projection formed on the top of said cover with a sloped guide surface, and

a retainer projection formed on the lower side of the front edge of said upper wall whereby said retainer projection is guided by said guide surface to be engaged with said angular projection when said cover is in a fully closed position to lock said cover in a fully closed position.

4,940,431

SERIES TERMINAL FOR TWO-WIRE POWER SUPPLY TO ELECTRICAL OR ELECTRONIC COMPONENTS, ESPECIALLY INITIATORS

Lothar-Roland Hennemann, Enger, Fed. Rep. of Germany, assignor to Wago Verwaltungsgesellschaft mbH, Minden, Fed. Rep. of Germany

Filed Feb. 13, 1989, Ser. No. 310,639

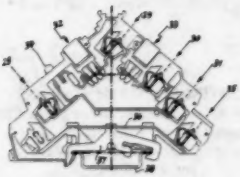
Claims priority, application Fed. Rep. of Germany, Feb. 15, 1988, 3805158

Int. Cl.[5] H01R *9/26*

U.S. Cl. 439—716 2 Claims

1. In a first series terminal of a type including a housing, first and second supply wire contacts in said housing and first and second bridge connectors in said housing electrically connected to said first and second supply wire contacts, respec-

tively, said first series terminal being adapted to be received on an assembly rail having first and second latch base points which are symmetrically disposed about a central plane, said first and second bridge connectors being connectable with one or both of the first and second bridge connectors of a second series terminal of identical configuration through one or a pair of bridges when said second series terminal is received in an adjacent position on said assembly rail, the improvement comprising said first and second bridge connectors of said first series terminal being symmetrically disposed with respect to said central plane and said first and second supply wire contacts of said first series terminal being disposed on the same side of said central plane when said first series terminal is



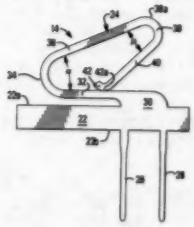
received on said assembly rail, whereby depending on the orientation of said second series terminal relative to said first series terminal when said first and second series terminals are assembled on said assembly rail, said first and second bridge connectors of said first series terminal can be alternatively electrically connected to the first and second bridge connectors, respectively, of said second series terminal or to the second and first bridge connectors, respectively, of said second series terminal in order to alternatively electrically connect the first and second supply wire contacts of said first series terminal to the first and second supply wire contacts, respectively, of said second series terminal or to the second and first contacts, respectively, of said second series terminal.

4,940,432

CONTACT ELEMENT FOR TEST SOCKET FOR FLAT PACK ELECTRONIC PACKAGES

John J. Consoli, and Norman E. Hoffman, both of Harrisburg, Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Sep. 8, 1989, Ser. No. 404,485
Int. Cl.[5] H01R *23/72*
U.S. Cl. 439—862 **8 Claims**



7. A contact element for use in electrical sockets, said element comprising:

an elongated and wide base section of thin stock providing a perimeter of narrow edges;

at least one lead extending outwardly from one said narrow edge of said base section; and

a generally looped beam section attached to another said narrow edge opposite to said one narrow edge, said beam section having first and second radiused portions separated by and attached to an elongated first leg portion, and a strap portion paralleling said base section and attached to and extending between said another narrow edge and said first radiused portion, said beam section further having a free end attached to said second radiused portion and extending towards said strap portion, said beam section being compressible whereupon an edge of said free end engages and slides along an edge of said strap portion.

4,940,433

PROTECTIVE CONTROL SYSTEM FOR WATERCRAFT

David M. Raher, 11029 Tenacious Dr., Indianapolis, Ind. 46236

Continuation-in-part of Ser. No. 189,953, May 3, 1988, abandoned. This application May 30, 1989, Ser. No. 358,593
Int. Cl.[5] B63H *21/22*
U.S. Cl. 440—1 **10 Claims**

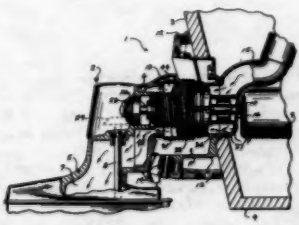
1. A watercraft comprising an engine, a propulsion means coupled to said engine and positioned to extend into the water when said watercraft is supported in the water, a switch mounted on said watercraft and having an actuating arm movably mounted on the watercraft and positioned to be in the water when said propulsion means is in the water, said propulsion means being adapted to cause the watercraft to move through the water with the water moving over the actuating arm as it also moves over the propulsion means, bias means acting on said switch to move it to an open circuit position but being overcome and moved to closed circuit position by water flowing over said actuating arm and propulsion means, said switch controlling the ignition of said engine and being opened to shut off said ignition when said actuating arm is no longer held in closed circuit position by said water moving over said actuating arm, said propulsion means including a propeller, said actuating arm being located in front of the propeller and in the path of the water as it moves into said propeller.

4,940,434

MARINE PROPULSION UNIT UNIVERSAL DRIVE ASSEMBLY WITH THROUGH-BELLOWS EXHAUST

Douglas A. Kiesling, Oshkosh, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Jan. 17, 1989, Ser. No. 297,947
Int. Cl.[5] B63H *25/42*
U.S. Cl. 440—57 **7 Claims**



1. A universal drive assembly (11) for connecting the rotary output (10) of an inboard marine engine (9) having an exhaust discharge element (15) to a rearwardly disposed outboard mounted stern drive unit (2), comprising, in combination:

(a) a universal joint (18) rotatable about a drive axis (27) and adapted for respective connection to the engine and stern drive unit,

(b) and exhaust passage means (44) surrounding said universal joint and connected to carry exhaust from the engine exhaust discharge element to the stern drive unit.

4,940,435

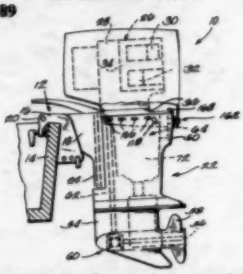
MARINE PROPULSION DEVICE

Harold L. Osborn, Winthrop Harbor; Matthew H. Mondek, Wonder Lake, both of Ill.; John C. Hervat, Kenosha, Wis., and Roger B. Whipple, Grayslake, Ill., assignors to Outboard Marine Corporation, Waukegan, Ill.

Filed Apr. 20, 1988, Ser. No. 183,894

Int. Cl.[5] B63H *21/32*

U.S. Cl. 440—89 **36 Claims**



30. An internal combustion engine comprising a cylinder, and a lower face having therein an exhaust outlet port communicating with said cylinder, an idle exhaust inlet port, and an idle exhaust outlet port, and said engine also comprising an idle exhaust passage communicating between said idle exhaust inlet port and said idle exhaust outlet port.

4,940,436

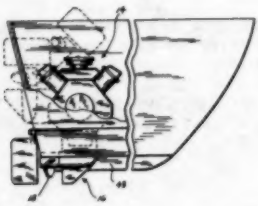
MARINE DRIVE SYSTEM WITH INBOARD MOUNTED ENGINE AND DEPENDING DRIVE UNIT

Neil A. Newman, Omro, Wis., assignor to Brunswick Corporation, Skokie, Ill.

Filed Sep. 28, 1988, Ser. No. 251,104

Int. Cl.[5] B63H *23/36*

U.S. Cl. 440—112 **14 Claims**



1. A marine drive for a boat, comprising:

an engine drivingly interconnected with an axially extending rotatable output shaft, said engine being located in the interior of said boat adjacent the boat transom; and

a drive unit drivingly interconnected with said output shaft and including a drive housing having a propeller rotatably mounted thereto, said drive unit including drive means for drivingly interconnecting said output shaft and said propeller, said drive housing being mounted to said boat so as to be pivotable about a pivot axis through a range of positions including a first position in which said propeller is submerged during boat operation with said drive unit extending substantially vertically relative to said engine, a second position in which said propeller is positioned out of the water and said drive unit is disposed at an angle to the vertical relative to said engine, and a third position in which said drive unit is positioned out of the water;

wherein said drive housing includes a longitudinally extending portion within which is disposed said drive means interconnected with a propeller shaft to which said propeller is mounted, and wherein said drive housing in its third position is positioned such that the longitudinal axis of the longitudinally extending portion of said drive housing is rotationally above a horizontal plane through the pivot axis of said drive housing; and

wherein said output shaft and the crankshaft of said engine extend along a common axis and extend substantially parallel to the boat transom, and wherein said output shaft defines the pivot axis about which said drive housing is pivotable.

4,940,437

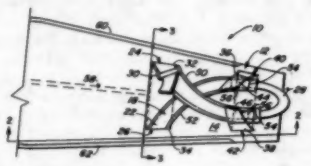
SWIM FIN WITH HARNESS

John A. Piatt, 226 Getchell St., Santa Cruz, Calif. 95060

Continuation-in-part of Ser. No. 202,109, Jun. 3, 1988, Pat. No. 4,889,510. This application Jan. 25, 1989, Ser. No. 301,442

Int. Cl.[5] A63C *31/10*

U.S. Cl. 441—62 **11 Claims**



1. A swim fin including a harness for securing the fin beneath a wearer's foot, the harness comprising

a strap passing behind the wearer's heel, along both sides of the foot and over an instep portion of the wearer's foot in an X configuration, to respective anchor points arranged on the swim fin on opposite sides of a forward portion of the wearer's foot,

means for adjusting the length of the strap to conform to the wearer's foot and to secure the swim fin in place,

the adjustable strap being formed by a single strap passing through slots at the forward anchor points and under the fin between the forward anchor points.

4,940,438

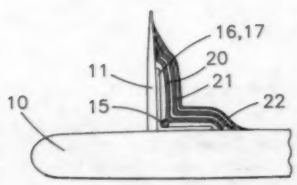
SURFBOARD WITH ANGULARLY RELATED FINS

S. Scott Miller, 5 W. Burlington Ave., Harvey Cedars, N.J. 08008

Filed May 12, 1989, Ser. No. 351,191

Int. Cl.[5] A63C *15/00*

U.S. Cl. 441—79 **9 Claims**



1. A surfboard comprising a board having a longitudinal axis and forward and rearward ends and a plurality of fins extending from a surface of said board,

at least one of said fins being an angular fin canted at an angle to said longitudinal axis and also tilted relative to the surface of said board,

a plurality of spaced fibers of high tensile modulus at least some of which are adhered to said fin and also adhered to the adjacent portion of said board, said fibers being distributed on said fin in a predetermined pattern whereby the tip portion of said angular fin has greater bending flexibility than does the body portion of said angular fin.

4,940,439

METHOD OF AND APPARATUS FOR MANUFACTURING BRAUN TUBES

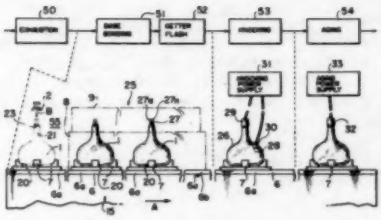
Teruo Yokosouchi, Chiba; Takumi Karasawa, Sakura, and Katuhisa Ono, Ibaraki, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Dec. 21, 1988, Ser. No. 287,035

Claims priority, application Japan, Dec. 25, 1987, 62-326918

Int. Cl.[5] H01S *9/32*

U.S. Cl. 445—5 **15 Claims**



1. A method for manufacturing a Braun tube comprising: a step of attaching a base by means of an adhesive resin to a portion of a Braun tube at a rear side thereof from which electrical connection terminals are protruded; thereafter, conveying said Braun tube while supporting said Braun tube on first conveying means with a faceplate thereof facing down to a drying furnace disposed at an intermediate portion on the conveying path of said first conveyor and therein locally heating an area around said base where said adhesive resin is deposited, thereby drying and hardening said adhesive resin; and, thereafter, effecting knocking by applying a voltage across electrodes through said electrical connection terminals.

4,940,440

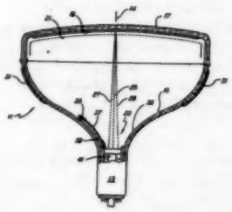
WEAK-BEAM SCANNING OF CATHODE RAY TUBES

Charles H. Rehkopf, Seneca Falls, N.Y.; Franklin G. Reigel, Ottawa, Ohio, and Samuel S. Chung, Liverpool, N.Y., assignors to North American Philips Corporation, New York, N.Y.

Continuation-in-part of Ser. No. 20,049, Feb. 27, 1987, abandoned. This application Dec. 23, 1987, Ser. No. 137,041

Int. Cl.[5] H01J *9/44*

U.S. Cl. 445—5 **13 Claims**



1. A method of processing a color cathode ray tube comprising scanning at least the central portions of the mask and the screen of the tube with a weak, defocused electron beam from the tube's electron gun, produced by impressing a voltage of from about 15 to 22 percent of the operating voltage on the anode of the electron gun, which scanning is carried out after exhausting, baking, sealing and getter flashing of the tube.

4,940,441

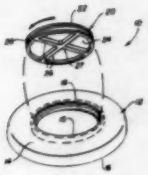
AERODYNAMIC FLYING DISC WITH WEIGHTED INSERT

Steven Novinsky, 30 Hamilton Ave., Fairview, N.J. 07022

Filed Oct. 23, 1989, Ser. No. 425,245

Int. Cl.[5] A63H *27/12*; A63B *65/10*

U.S. Cl. 446—46 **16 Claims**



1. An aerodynamic flying disc comprising:

a thin-walled annular rim containing central and perimeter portions, wherein the perimeter portion defines a central cavity situated within the central rim portion, in which upper and lower openings are connected by a threaded circular sidewall, the perimeter portion of said annular rim curling downwardly to form a circumferential lip about the rim; and

a rotatably removable insert, threadably engaged within the central cavity, comprising upper and lower circular surfaces whose diameters are slightly smaller than the corresponding openings of the central cavity, and which are connected by a threaded circular sidewall, the height of which is substantially identical to the height of the central cavity, whereby the insert may be rotatably removed from the central cavity by rotating it about its axis thereby threadably disengaging it from said central cavity, and wherein the insert bears indicia, and wherein the circular sidewall of the insert comprises an inner surface along which runs a circumferential groove and within which is situated a removable circular plate, said plate having a chosen weight.

4,940,442

CONNECTABLE SELF-POWDERED MOBILE TOY

Takashi Matsuda, Tokyo, Japan, assignor to Takara Co., Ltd., Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,694

Claims priority, application Japan, Jun. 23, 1987, 62-96150[U]

Int. Cl.[5] A63H *17/00, 33/04*

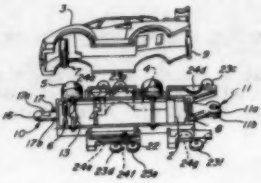
U.S. Cl. 446—90 **15 Claims**

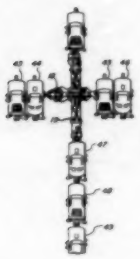
1. In an improved connectable mobile toy vehicle, the improvement comprising:

a body member, and

a plurality of connecting means arranged around the periphery of the body member, including a plurality of male projections and a plurality of female receptacles capable of receiving the male projections, one of the male projections comprising a ball mounted to the toy vehicle on a

horizontally-disposed slender neck, and one of the female receptacles comprising a pair of split annular members mounted to the toy horizontally, one over the other, with the splits located on distal ends of the annular members such that the ball of the male projection can be snapped into position in between the annular female members whereby a plurality of such toy vehicles can be interconnected in various combinations including both front-to-back, as well as side-to-side arrangements, other male projections on a side of the toy vehicle include spaced horizontally-disposed disc members, the spaces between the disc members being capable of receiving the disc members from a second toy vehicle and also functioning as female receptacles.





4,940,443

RACE TRACK HAVING LATERAL EDGES AND BRIDGES FOR RETAINING TOY VEHICLES

Kurt Hesse, Waldstrasse 36, D-8510 Fürth, Fed. Rep. of Germany

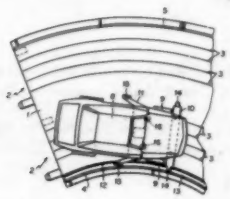
PCT No. PCT/DE86/00448, § 371 Date Sep. 17, 1987, § 102(e) Date Sep. 17, 1987, PCT Pub. No. WO87/04363, PCT Pub. Date Jul. 30, 1987

PCT Filed Nov. 5, 1986, Ser. No. 117,067

Claims priority, application Fed. Rep. of Germany, Jan. 27, 1986, 3602341

Int. Cl.[5] A63H *18/08*

U.S. Cl. 446—445 **10 Claims**



1. An automobile race track toy set having a roadway formed by straight and curved raceway segments, with two lanes having embedded current conductors in which the raceway segments include inside and outside guiding edges, along which toy vehicles slide by means of a bridge, and the curved raceway segments include, parallel to and spaced from said inside guiding edge, an upright supporting wall lower in height than said inside guiding edge and in which said bridge, by means of a rod-shaped, downwardly directed supporting member engages a groove-shaped space formed between said inside guiding edge and said supporting wall and which can be placed on said supporting wall by means of centrifugal force, said race track toy set further comprising:

(a) a molded part which is substantially L-shaped in cross-section, and in its longitudinal direction it mates with the curvature of said inside guiding edge, arranged detachably fixed on said curved raceway segment by means of clamping elements;

(b) a first leg of said molded part spaced vertically from said upright supporting wall, so as to form an aperture into said groove-shaped space between said first leg and said upright supporting wall, and a second leg of said molded part being detachably fixed in position on said raceway segment by means of said clamping elements; and

(c) said toy vehicle including a front and a rear bridge which penetrate said aperture formed by said supporting wall and said first leg of said molded part and project into the groove-shaped space.

4,940,444

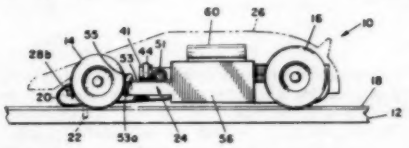
MINIATURE VEHICLE WITH MAGNETIC ENHANCEMENT OF TRACTION

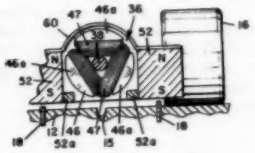
James B. Russell, 5544 Vista Del Dia, Anaheim Hills, Calif. 92807

Filed Jan. 5, 1989, Ser. No. 293,622

Int. Cl.[5] A63H *18/00, 33/26;* A63G *9/16*

U.S. Cl. 446—446 **16 Claims**





1. A miniature vehicle adapted to operate on a track including as a part thereof electric power conductor means made of a magnetic material comprising;

a support chassis;

a drive wheel mounted to said chassis;

an electrical pick-up shoe engageable with said power conductor means;

an electric motor mounted on said chassis;

said electric motor including a rotatably mounted drive shaft coupled to said drive wheel;

an armature means mounted on said drive shaft;

means for coupling said armature means to said pick-up shoe for providing electrical power to said electric motor;

a pair of magnets mounted to said chassis on opposite sides of said armature means and forming a stationary magnetic component of said electric motor;

each of said magnets mounted so that the North/South axis thereof is vertically disposed relative to said track with the same polarity of said pair of magnets at a upper surface thereof; and

flux bridge means connected to the upper surface of each of said magnets and overlying said armature means thereby to direct magnetic flux from said pair of magnets in a

single direction whereby said pair of magnets and said flux bridge means cooperate to provide an enhanced magnetic force at said electric power conductor means to thereby attract said vehicle toward said track and increase the traction of said drive wheel on said track.

4,940,445

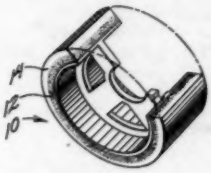
TIRE AND PROCESS FOR MAKING A TIRE

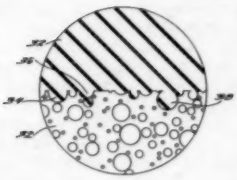
Aubrey S. DesPortes, 184 Belle Lindler Rd., Gilbert, S.C. 29054

Filed Sep. 27, 1989, Ser. No. 413,112

Int. Cl.[5] A63H *17/00*; B32B *31/00*; B60C *7/00*; B60B *1/06*

U.S. Cl. 446—465 **12 Claims**





1. A tire made by a process comprising the steps of:

wrapping at least one layer of a rubber material around a foam core to form an intermediate composite, said rubber material having an inner surface;

placing said intermediate composite in a mold; and

heating said mold to a temperature between 180 and 300 degrees Fahrenheit for 40 to 60 minutes to cure said composite material and to fuse said foam core to said inner surface of said rubber material.

4,940,446

COUPLING STRUCTURE FOR A ROTATING MEMBER AND A SHAFT

Masaki Inui; Mitsuhiko Okada; Seitoku Kubo; Shozoh Okuda, and Masaki Hosono, all of Toyota, Japan, assignors to Toyota Jidosha Kabushiki Kaisha, Toyota, Japan

Filed Sep. 28, 1987, Ser. No. 101,831

Claims priority, application Japan, Sep. 26, 1986, 61-22778; Sep. 26, 1986, 61-227789; Nov. 6, 1986, 61-264642; Nov. 10, 1986, 61-267294

Int. Cl.[5] F16H *57/04*

U.S. Cl. 474—91 **27 Claims**

1. A coupling structure for a rotating member and a shaft, comprising:

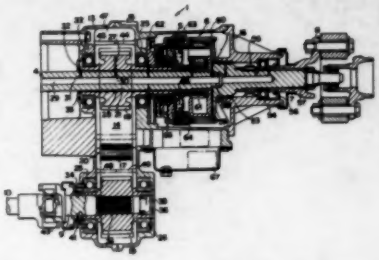
a fitting bore in said rotating member, and extending along the center axis thereof, said fitting bore opening into at least one of the axial end portions of said rotating member and having a diameter larger than an outside diameter of said shaft;

a case accommodating said rotating member, said rotating member being positioned in said case such that said fitting bore opens toward the outside of said case;

means for holding said rotating member in said case in a rotatable manner;

an air communication portion for providing communication between the inside of said fitting bore and said case; and

valve means for selectively opening and closing said air communication portion,



wherein said shaft is inserted from the outside of said case into said fitting bore, including means for coupling said shaft to rotate integrally with said rotating member.

4,940,447

AUTOTENSIONER FOR ADJUSTING THE TENSION OF A TIMING BELT

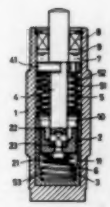
Kazuki Kawashima; Makoto Yasui; Hisashi Hayakawa, and Masayuki Imoto, all of Iwata, Japan, assignors to NTN Toyo Bearing Co., Ltd., Osaka, Japan

Filed May 12, 1989, Ser. No. 351,129

Claims priority, application Japan, Apr. 27, 1989, 1-44715[U]

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—110 **3 Claims**



1. An autotensioner for adjusting the tension of a timing belt, comprising a cylinder case, a piston slidably mounted in said cylinder case so as to partition the interior thereof into a pressure chamber and a reservoir chamber, said piston being formed with a channel for communicating said reservoir chamber with said pressure chamber, a push rod having one end thereof secured to said piston and the other end adapted to protrude out of said cylinder case, elastic means for biassing said piston and said push rod toward said reservoir chamber, a retainer mounted under said piston at the side of said pressure chamber, and a check plate held in said retainer so as to be movable between two positions to open and close said channel.

4,940,448

BRAKING DEVICE FOR DRIVE BELTS

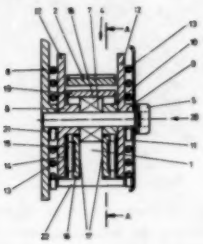
Jürgen Kober, Schweinheim, and Manfred Brandenstein, Eussenheim, both of Fed. Rep. of Germany, assignors to SKF GmbH, Schweinfurt, Fed. Rep. of Germany

Filed Nov. 18, 1988, Ser. No. 273,413

Claims priority, application Fed. Rep. of Germany, Nov. 20, 1987, 3739373

Int. Cl.[5] F16H *7/08*

U.S. Cl. 474—111 6 Claims



1. A braking device for drive belts comprising a swivel arm, a rotatable idler attached to one end of the swivel arm and adjoining the drive belt, a swivel bearing attached to the other end of the swivel arm, damping elements acting in the swivel direction and spring elements acting in the swivel direction wherein the drive belt extends in a circumferential section of a ring shaped space surrounding said swivel bearing and extends tangentially a small distance to said swivel bearing and wherein said damping elements are arranged joining said circumferential section in said ring shaped space and essentially arranged diametrically opposite the drive belt relative to the swivel axis.

4,940,449

PAPER FEED TRACTOR

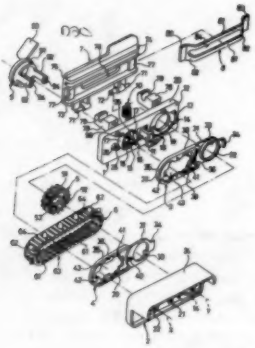
Sadao Unuma, Oobu, Japan, assignor to Tokai Kogyo Kabushiki Kaisha, Oobu, Japan

Filed Oct. 3, 1989, Ser. No. 416,477

Claims priority, application Japan, Nov. 19, 1988, 63-291100

Int. Cl.[5] F16H *7/18*

U.S. Cl. 474—140 2 Claims



1. A paper feed tractor for transporting paper having feed holes formed at equal intervals in a row along a side edge thereof, comprising

a tractor frame, a belt guide formed on said tractor frame, a sprocket wheel supported for rotation on said tractor frame, an endless belt extending between said sprocket wheel and said tractor frame and adapted to be driven by said sprocket wheel to travel along a guide path formed by said sprocket wheel and said belt guide, said endless belt having feed pins provided projectingly on an outer peripheral face thereof in a row at the same equal intervals to those of the feed holes formed along the side edge of the paper,

said belt guide having a liner guide portion thereon, a cover supported at a side edge of said tractor frame along said linear guide portion of said belt guide for selective pivotal motion between a first position in which said cover extends substantially in a parallel relationship above said linear guide portion of said belt guide and a second position in which said cover opens a location above said linear guide portion of said belt guide, and a paper holder formed in the form of an elongated planar plate and bent at the longitudinal opposite end portions thereof to support said paper holder on a face of said cover opposing to said linear guide portion of said belt guide such that a main portion of said paper holder is spaced from said face of said cover, wherein said paper holder is disposed such that, when said cover is at the first position, said main portion thereof is opposed to said linear guide portion of said belt guide in parallel to the longitudinal direction of said linear guide portion and is positioned in parallel to said outer peripheral face of said endless belt on at least one side of said feed pins of said endless belt which travels on said linear guide portion of said belt guide, and

a peripheral face portion of said outer peripheral face of said endless belt on which said feed pins are provided projectingly being formed into a non-slipping face on which concave and convex portions of a small difference in dimension are formed wherein when said cover is at the first position, the distance between said convex portions of said non-slipping face of said endless belt and a face of said main portion of said paper holder opposing to said convex portions is made smaller than the thickness of the paper.

4,940,450

POWER TRANSMISSION SYSTEM USING TOOTHED BELT OF ENGINE FOR VEHICLE

Noriyuki Miyamura; Seizo Iwasa, both of Kyoto; Hiroshi Asano, Kameoka; Isamu Nagai, Nagaokakyo; Hayato Hamada, Kyoto; Shuji Sasaki; Takeshi Kinoshita, both of Kameoka, and Masaru Sui, Uji, all of Japan, assignors to Mitsubishi Jidosha Kogyo Kabushiki Kaisha, Tokyo, Japan

PCT No. PCT/JP88/00563, § 371 Date Feb. 17, 1989, § 102(e) Date Feb. 17, 1989, PCT Pub. No. WO88/10384, PCT Pub. Date Dec. 29, 1988

PCT Filed Jun. 13, 1988, Ser. No. 313,968

Claims priority, application Japan, Jun. 17, 1987, 62-92083[U]; Feb. 19, 1988, 63-21064[U]

Int. Cl.[5] F16H *55/30*

U.S. Cl. 474—152 1 Claim

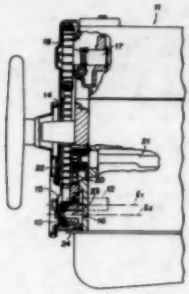
1. A power transmission system using toothed belt of engine for vehicle comprising:

(a) a toothed drive pulley mounted on a drive shaft of an engine, having tooth tips lying in a plane in parallel with a rotational axis of said drive pulley;

(b) a toothed driven pulley mounted on a drive shaft, having tooth tips tapered so that the diameter of said driven pulley at one axial end thereof is larger than the diameter thereof at the other axial end thereof, and a guide disposed at said one axial end of said toothed driven pulley and having a diameter larger than any diameter of said toothed driven pulley, wherein cross-sectional profiles of said tapered tooth tips of said driven pulley are the same at opposite axial ends of said tooth tips as seen in a plane perpendicular to said driven shaft;

(c) a toothed belt trained around said toothed drive pulley and said toothed driven pulley, said toothed belt having teeth lying in plane parallel to the width of said belt,

whereby when said toothed belt is rotated by the drive force of said drive shaft, said toothed belt sequentially meshes with said toothed driven pulley from the larger



diameter portion thereof to the smaller diameter portion thereof, thereby transmitting the drive force of said drive shaft to said toothed driven pulley.

4,940,451

ADJUSTABLE GAME CALL DEVICE

Scott C. Leady, 101 Clinton, Grand Haven, Mich. 49417

Filed Dec. 7, 1988, Ser. No. 281,022

Int. Cl.[5] A63H *5/00*

U.S. Cl. 446—208 **18 Claims**

1. An adjustable game call device comprising:

wall means defining an elongated air flow resonance chamber;

a reed that is elongated along an axis, said reed positioned within said chamber and adapted to vibrate in response to air flowing through said chamber;

means defining an opening in said wall means elongated in a direction generally parallel said axis and generally overlying the position of said reed;

a tuning member extending through said opening and glidably mounted to said wall means by mounting means for mounting said tuning member to glide in the direction of elongation of said opening, said tuning member having a first end portion abutting said reed and an opposite end portion external of said chamber such that said first end portion is selectively positionable along the axis of elongation of the reed by movement of said opposite end portion in said direction of elongation; and

air closure means for providing a substantially airtight covering of said opening in a manner that accommodates the slidable movement of said tuning member in said opening such that the pitch of said reed is adapted for adjustment without disassembly of portions of the game call device.

4,940,452

MAGNETIC COUPLING

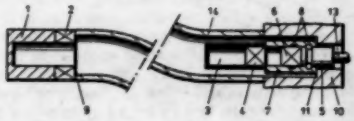
Karl-Heinz Robe, Haan; Kurt Sauerwein, Kattendahl 7, 4006 Erkrath; Karl Weinlich, Wuppertal; Rainer Link, Kerpen-Horrem, and Norbert Kinzer, Wuppertal, all of Fed. Rep. of Germany, assignors to Kurt Sauerwein, Fed. Rep. of Germany

Filed Aug. 16, 1988, Ser. No. 232,753

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3731946

Int. Cl.[5] A61N *5/10*; **A61M** *37/00*

U.S. Cl. 600—7 **12 Claims**



1. A magnetic coupling between translatorily movable bodies, comprising:

a first body (1) having a coupling element (2) of permanently magnetic or magnetizable material;

a second body (3) having at least one complementary coupling element (4) of permanently magnetic or magnetizable material complementary to the coupling element of the first body, the second body being insertable into the first body and being magnetically maintainable in the first body by the coupling element of the first body and the coupling element of the second body;

a third body (5) having a coupling element (6) of permanently magnetic or magnetizable material, the coupling element of the third body being arranged so as to cooperate with the complementary coupling element of the second body so as to allow withdrawal of the second body from the first body; and

a spacer (7), arranged so as to separate the complementary coupling element of the second body and the coupling element of the third body, the spacer being selectively movable with respect to said coupling element of said third body between two different positions.

4,940,453

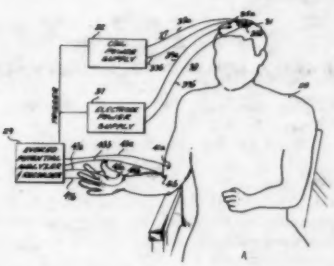
METHOD AND APPARATUS FOR MAGNETICALLY STIMULATING NEURONS

John A. Cadwell, Kennewick, Wash., assignor to Cadwell Industries, Inc., Kennewick, Wash.

Filed Jan. 28, 1987, Ser. No. 8,210

Int. Cl.[5] A61B *15/05*

U.S. Cl. 600—13 **21 Claims**



1. A method of stimulating the neural pathways of an organism, such as the human body, to create evoked potentials by

depolarizing neurons forming part of the neural pathway to be stimulated, said method comprising the steps of:

placing a stimulator coil on the surface of the organism in the region where a neural pathway is to be stimulated; and,

energizing the stimulator coil by applying sinusoidal voltage to the coil that causes a high sinusoidal current to flow in the coil that causes the coil to generate a magnetic field that creates an electric field in the body of said organism in the region where a neural pathway is to be stimulated, said sinusoidal current flow being in phase quadrature with and lagging the sinusoidal voltage, the magnitude of said sinusoidal voltage being inadequate to create a current flow sufficient to generate a magnetic field that creates a neuron depolarizing electric field in the body of said organism during the first quarter of the first sinusoidal cycle of said applied voltage and adequate to generate a magnetic field that creates a neuron depolarizing electric field in the body of said organism during the second and third quarters of the first sinusoidal cycle of said applied voltage.

4,940,454

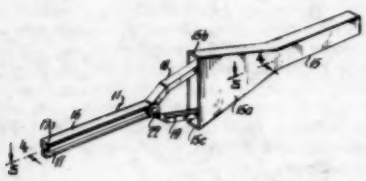
HYGIENIC SWAB-TYPE DEVICE WITH EXTENDER HANDLE COVER

Angela Siragusa, 1645 Overing St., Bronx, N.Y. 10461

Filed Jan. 23, 1989, Ser. No. 299,270

Int. Cl.[5] A61M *35/00*

U.S. Cl. 604—1 **14 Claims**



1. A hand held tong-like device comprising, pivotally connected tongs, the tongs having respective clamping end portions normally in a closed position and manually operable to an open position and having operating end portions for manually operating the tongs to said open position, biasing means continuously biasing the tongs to said closed position, a cover for housing the tongs therein when not in use, the cover forming an extended handle for said device when in use and defining a pocket into which the operating ends of the tongs are insertable effectively holding the tongs in the closed position, and the cover providing an elongated extension for the tongs when the operating ends thereof are inserted into said pocket; whereby access to body areas to be cleansed with a hygienic swab held by said tongs are facilitated, particularly for those users who are overweight, have short arms or may be otherwise handicapped.

4,940,455

METHOD AND APPARATUS FOR SINGLE NEEDLE DIALYSIS

Perry W. Guinn, Idaho Falls, Id., assignor to CD Medical, Inc., Miami Lakes, Fla.

Filed Apr. 13, 1989, Ser. No. 337,948

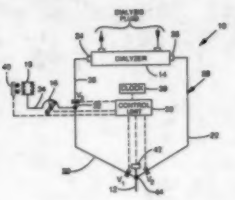
Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—5 **7 Claims**

1. In a single needle dialysis apparatus that includes a blood circuit loop including tubing and extending from a single needle through a hemodialyzer and back to the single needle, an improvement comprising:

blood accumulator means for accumulating a supply of blood; and

pump means coupling the accumulator means to the blood circuit loop and operable in first and second directions for drawing blood from the single needle into the accumulator means when operated in the first direction and for pumping blood from the accumulator means through the dialyzer and back to the single needle when operated in the second direction;



wherein said blood accumulator means and pump means form a single ended arm extending from said blood circuit loop.

4,940,456

ELECTROLYTIC TRANSDERMAL DELIVERY OF PROTEINS

Dan Sibalis, 268 Hallock Rd., Stony Brook, N.Y. 11790, and Sanford Rosen, 64 E. 86th St., New York, N.Y. 10028

Continuation of Ser. No. 12,898, Feb. 10, 1987, abandoned. This application Dec. 1, 1988, Ser. No. 279,315

Int. Cl.[5] A61M *37/00*

U.S. Cl. 604—20 **8 Claims**

1. A transdermal patch for delivering at least one protein drug to the bloodstream of the patient comprising:

a. at least one protein drug comprising at least one nonionic protein having more than 20 peptide units, water, and a water-destructuring agent with a negative Setschenow constant, contained in a drug reservoir, and

b. electrolytic means comprising a power source connected to at least one electrode in electrolytic contact with said reservoir for transdermal transport of the nonionic protein having a current density from about 0.5 microampere/cm^2 to about 10 milliampere/cm^2, impressed voltage between 1 and 40 volts, and a migratory water volume between 0.001/ml/cm^2 hr and 0.01 ml/cm^2/hr, whereby the skin of the patient is neither irritated nor erythematized.

4,940,457

IRRIGATION SYSTEM FOR USE DURING ARTHROSCOPY

Daniel H. Olson, Louisville, Ohio, assignor to Snyder Laboratories, Inc., Dover, Ohio

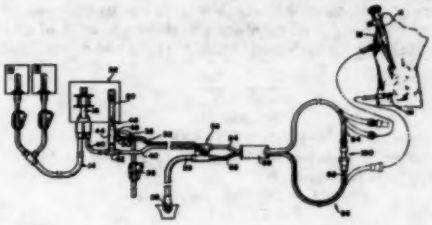
Filed Dec. 23, 1987, Ser. No. 137,138

Int. Cl.[5] A61M *1/00*

U.S. Cl. 604—30 **6 Claims**

1. An irrigation system for arthroscopy of a joint comprising a fluid circuit communicating with a fluid reservoir, means for pressurizing the fluid within the fluid circuit to generate fluid flow within the fluid circuit, the fluid circuit having means separable at a predetermined location to define a first end adapted for communicating the fluid circuit into the joint via a first cannula connected to the first end and extending into the

joint and a second end adapted for communicating the fluid circuit into the joint via a second cannula connected to the second end and extending into the joint, the first and second cannula extending into the joint, and the fluid circuit includes a monitor check valve assembly near the predetermined location which is open during a prime mode to permit fluid communication therethrough in order to fill the fluid circuit with



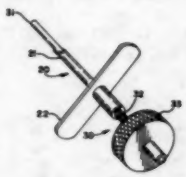
fluid before the fluid circuit is separated, the monitor check valve assembly being closed immediately following separation to trap fluid downstream thereof in the fluid circuit, and the monitor check valve assembly providing the fluid communication from the joint to the fluid circuit downstream of the second end when the fluid circuit is separated and the second end is connected to the second cannula to open the monitor check valve assembly.

4,940,458

EPIDURAL NEEDLE PLACEMENT SYSTEM

Arnold K. Cohn, 1415 Meadow La., Glenview, Ill. 60025

Filed Feb. 2, 1989, Ser. No. 305,784
Int. Cl.[5] A61M *5/00*
U.S. Cl. 604—51 **2 Claims**



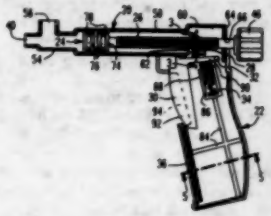
1. An epidural needle placement device that comprises:
- a hollow barrel having a sharp tip at its distal end and internal threads on its proximal portion;
- a hollow epidural needle having a blunt tip at its distal end and external threads on its proximal portion that are adapted to engage the internal threads on said barrel;
- a flat tab that engages the barrel and is adapted to prevent penetration of the barrel into the epidural space of a patient;
- a knob that is affixed to the proximal end of the epidural needle that is adapted to advance the needle with respect to the barrel upon rotation of said knob; and
- a pressure monitor that is affixed to the proximal tip of the needle to monitor changes in pressure upon entry of the needle into the epidural space of the patient.

4,940,459

INFLATION DEVICE FOR BALLOON CATHETER

Louis O. Noce, Longwood, Fla., assignor to Mallinckrodt, Inc., St. Louis, Mo.

Filed Oct. 12, 1988, Ser. No. 256,866
Int. Cl.[5] A61M *29/00*
U.S. Cl. 604—98 **19 Claims**



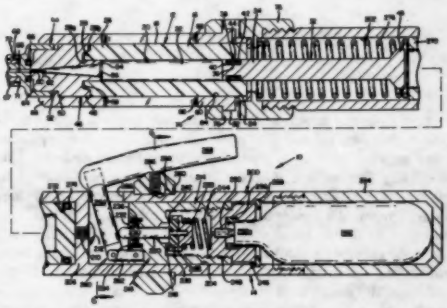
1. A device for inflating a balloon catheter, comprising:
- a tubular barrel for receiving an inflation fluid and having fluid outlet means at one end for connecting the barrel to the catheter,
- a plunger having a sliding piston in the barrel and a threaded shank extending from the piston out the other end of the barrel,
- a pistol grip handle mounted on the barrel, said pistol grip handle extending from one side of the barrel for being gripped, on one side by a thumb and on the opposite side by the four fingers of a hand of an operator,
- a trigger pivotally mounted in the handle and having a thread section for being pivoted into engagement with the threaded shank of the plunger,
- means for biasing the trigger to urge the thread section thereof into engagement with the threaded shank,
- a knob on the plunger shank for enabling an operator to screw the plunger into and out of the barrel to increase and decrease the pressure of the inflation fluid, and
- said trigger being positioned in the handle so as to be operable by a finger of the hand gripping the handle to release engagement of the thread section from the threaded shank to enable free sliding movement of the plunger in the barrel.

4,940,460

PATIENT-FILLABLE AND NON-INVASIVE HYPODERMIC INJECTION DEVICE ASSEMBLY

James P. Casey, I., Forest Grove, and J. Thomas Morrow, Portland, both of Oreg., assignors to Bioject, Inc., Portland, Oreg.

Continuation-in-part of Ser. No. 64,762, Jun. 19, 1987, Pat. No. 4,790,824. This application Dec. 12, 1988, Ser. No. 283,737
Int. Cl.[5] A61M *37/00*
U.S. Cl. 604—143 **15 Claims**



1. A hypodermic syringe comprising:

an ampule body having a plunger end and an orifice end, said body having a generally elongate cylindrical form with an outer wall of predetermined diameter and an inner wall defining a medication retaining cavity, a flange which is a continuation of said inner wall which is located at said orifice end and extends axially outward therefrom, said flange having an outer wall which is located intermediate said body inner wall and said body outer wall;

an elongate plunger, one end thereof having a seal-carrying groove formed about the periphery thereof and being received in said medication retaining cavity with a seal received in said groove;

an orifice-bearing end cap fixed to said orifice end, said end cap having a generally cylindrical form including a medication-receiving portion extending axially into said medication retaining cavity at one end thereof, said end cap having a groove extending about said medication-receiving portion at the base thereof, said groove being conformal with said flange on said body;

a truncated hypodermic needle received in said end cap and having a channel extending therethrough, said channel communicating with the narrower end of said bore;

a filling needle having connecting means thereon; and

a removable external fill adaptor having a receptacle on one end thereof for receiving said end cap therein and a bore extending therethrough, said bore being aligned with said truncated hypodermic needle on said end cap, means on the other end of said adaptor cooperating with said connecting means for securing said filling needle to said adaptor.

4,940,461

FILTER FOR ATTACHMENT TO AN OSTOMY BAG

Peter L. Steer, Surrey, England, assignor to E. R. Squibb & Sons, Inc., Princeton, N.J.

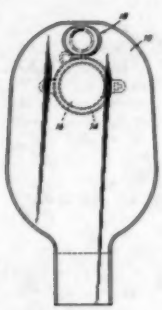
PCT No. PCT/GB88/00149, § 371 Date Oct. 24, 1988, § 102(e) Date Oct. 24, 1988, PCT Pub. No. WO88/06433, PCT Pub. Date Sep. 7, 1988

PCT Filed Mar. 1, 1988, Ser. No. 267,466

Claims priority, application United Kingdom, Mar. 2, 1987, 8704826

Int. Cl.[5] A61F *5/44*

U.S. Cl. 604—333 **3 Claims**



1. A filter for attachment to an ostomy bag and which comprises three parts, the first part including a synthetic plastics base member having a central aperture therein and one substantially flat surface whereby the filter can be attached by plastics welding or adhesive to a wall of the ostomy bag, there being two walls upstanding from the other side of the base member to define a channel and the inner wall defining with the base member a shallow recess, the second part being a pad consisting essentially of a filtering medium and having a height substantially equal to that of the recess and lateral dimensions such that it fits snugly within the recess, and the third part being a lid member of synthetic plastics material having a substantially flat top through which are provided a peripheral array of apertures to provide fluid communication directly directly between ambient atmosphere and said recess, therebeing a wall extending from the flat top and having such a height, shape and width that it is a snug push fit within the channel; whereby the lid member is readily removable to allow replacement of the said pad, said wall on the lid member and one or both of the walls on the base member having a projection or a series of projections whereby a snap fit can be achieved between the base and lid members, said peripheral array of apertures being located adjacent to and interiorly of the wall of said lid.

4,940,462

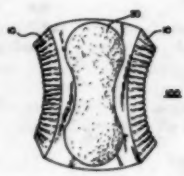
SANITARY NAPKIN WITH EXPANDABLE FLAPS

Catherine E. Salerno, Milliagton, N.J., assignor to McNeil-PPC, Inc., Milltown, N.J.

Filed Feb. 26, 1988, Ser. No. 160,739

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—387 **7 Claims**



1. A sanitary napkin comprising

(a) an absorbent element having longitudinally extending sides, transverse ends, a body-facing side and an undergarment facing side;

(b) stretchable, longitudinally resilient flaps extending outwardly along said longitudinally extending sides, said flaps expanding longitudinally when folded over a side of a crotch portion of an undergarment.

4,940,463

DISPOSABLE COMBINED PANTY WITH SANITARY NAPKIN

Sherman Leathers, 1104 E. 55th St., Brooklyn, N.Y. 11234, and Geronimo C. Williamson, 535 Lafayette Ave., Brooklyn, N.Y. 11205

Filed Feb. 17, 1987, Ser. No. 15,240

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—396 **10 Claims**

1. A disposable panty comprising:

a tubular body portion to provide outer and inner layers with said inner layer being disposable against a wearer thereof;

said tubular body portion having an hour-glass configuration to provide an intermediate narrow crotch portion and opposing front and rear wide waist band portions;

a sanitary napkin to absorb menstrual discharge of the wearer being disposed within said crotch portion between said outer and inner layers of said tubular body portion;

a liquid impervious sheet disposed between said sanitary napkin and said outer layer to prevent passage of the menstrual discharge to said outer layer;

said sanitary napkin including a frame member having a central opening therethrough extending from a first side to an opposing second side of said frame member, and absorbent means disposed within said central opening in a compact arrangement;

said first side of said frame member being positioned against said inner layer, and said second side of said frame member being positioned against said liquid impervious sheet;

first surfaces of said absorbent means being disposed against said inner layer, and second surfaces of said absorbent means being disposed against said liquid impervious sheet;

said absorbent means comprising a plurality of absorbent balls; and

securing means for securing said front and rear waist bans portions to the wearer to provide a bikini type panty.

4,940,464

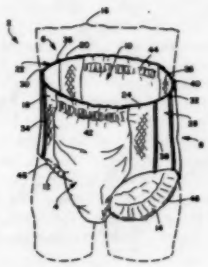
DISPOSABLE INCONTINENCE GARMENT OR TRAINING PANT

Paul T. Van Gompel, Hortonville; Jody D. Suprise, Neenah, and Robert J. Schleinz, Appleton, all of Wis., assignors to Kimberly-Clark Corporation, Neenah, Wis.

Continuation of Ser. No. 133,674, Dec. 16, 1987, abandoned. This application Jul. 11, 1989, Ser. No. 379,026

Int. Cl.[5] A61F *13/16*

U.S. Cl. 604—396 **51 Claims**



1. A disposable pant-like garment for absorbing human discharge comprising:

an absorbent assembly comprising a liquid-impervious outer cover, a liquid-pervious liner, and an absorbent medium therebetween; said absorbent assembly further comprising generally opposite side edges and generally opposite end edges,

stretchable side panels and said absorbent assembly being joined together to form a waist opening and a pair of leg openings, portions of said absorbent assembly side edges being generally adjacent respective said leg openings, said absorbent assembly end edges being generally adjacent said waist opening, and

a gathering means being joined along a crotch portion of each said leg opening adjacent said absorbent assembly for gathering said crotch portion, a remaining portion of each said leg opening being relatively non-gathered, whereby said stretchable side panels provide generally inwardly directed force vectors against a wearer to maintain said garment snugly against the wearer's body and said absorbent assembly snugly in place against the crotch area both before and after a discharge, and said gathering means and said side panels provide elasticity about said leg openings to prevent leakage thereat.

4,940,465

DISPENSER COMPRISING DISPLACEABLE MATRIX WITH SOLID STATE PROPERTIES

Felix Theeuwes, 1643 Fallen Leaf La., Los Altos, Calif. 94022; Patrick S.-L. Wong, 1371 Xavier Ave., Hayward, Calif. 94545; Richard Cortese, 20802 Laurel Rd., Los Gatos, Calif. 95030, and James B. Eckenhoff, 1080 Autumn La., Los Altos, Calif. 94022

Division of Ser. No. 54,714, May 27, 1987, Pat. No. 4,892,778. This application Nov. 7, 1988, Ser. No. 268,401

Int. Cl.[5] A61K *9/22*

U.S. Cl. 604—892.1 **15 Claims**

1. A dispenser for administering a beneficial agent formulation to an animal environment of use, the dispenser comprising:

(a) a wall that surrounds and defines an internal lumen, the wall comprising at least in a part a semipermeable composition that is permeable to the passage of fluid and is substantially impermeable to the passage of a beneficial agent;

(b) first means comprising a member selected from a solid and semisolid pharmaceutically acceptable carrier in the lumen for administering a beneficial agent to the animal environment of use, said means substantially maintaining its physical and chemical integrity while in the lumen of the dispenser;

(c) a beneficial agent in the first means for administering a beneficial agent;

(d) second means adjacent to the first means for occupying an increasing amount of space in the lumen for urging the first means comprising the beneficial agent from the dispenser; and

(e) an opened mouth in the dispenser comprising a cross-sectional dimension substantially equal to the cross-sectional dimension of the lumen for displacing the first means substantially intact and unchanged and comprising the beneficial agent for administering the beneficial agent to the environment of use.

4,940,466

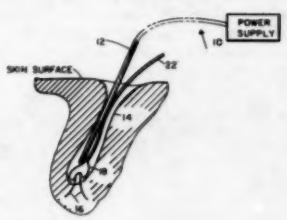
METHOD OF ELECTROLYSIS

Ann Paduano, and Jerome G. Paduano, both of P.O. Box 97, Cold Spring Harbor, N.Y. 11724

Filed Apr. 17, 1989, Ser. No. 339,254

Int. Cl.[5] A61B *17/41*

U.S. Cl. 606—36 **14 Claims**



1. A method of epilation by thermolysis comprising the steps of:

a. inserting a probe having a tip into a follicle containing a

hair shaft, with said tip of said probe terminating adjacent the papilla of said hair shaft, said probe being connected to apparatus for delivering upon actuation to said probe a burst of high frequency energy to produce heat in the tip of said probe, said apparatus comprising means to establish the duration of said burst and means to select the intensity of said burst, the combination of the duration established and the intensity selected representing the total heat energy delivered in each burst to the tip of said probe to the follicle;

b. selecting a combination of duration and intensity for each burst so that the total heat energy of each said burst is a least about 50% but no more than about 80% of that ordinarily required to coagulate said papilla;

c. applying multiple such bursts of energy to said probe;

d. partially withdrawing said probe so that said tip is located at some intermediate point along the length of said follicle;

e. applying multiple said bursts of energy to said probe;

f. partially withdrawing further said probe so that said tip is located at some further intermediate point along the length of said follicle;

g. applying multiple said bursts of energy to said probe;

h. withdrawing said probe out of said follicle;

i. removing said hair shaft; and

j. repeating the preceding steps of applying multiple said bursts of energy at three spaced points along said follicle.

4,940,467

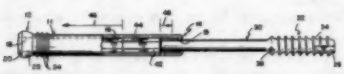
VARIABLE LENGTH FIXATION DEVICE

Raymond G. Tronzo, 255 Clarke Ave., Palm Beach, Fla. 33480

Continuation of Ser. No. 151,947, Feb. 3, 1988, abandoned. This application Nov. 30, 1989, Ser. No. 443,924

Int. Cl.[5] A61B *17/58*

U.S. Cl. 606—66 **6 Claims**



1. A screw for fixing proximal and distal fragments in a bone fracture, comprising

(A) a first and second element that

(1) are non-separably interconnected,

(2) each have a longitudinal axis in line with the other,

(3) longitudinally telescope with each other, and

(4) have means for rotationally fixing the elements to each other;

(B) the first element having

(1) a first shank portion, and

(2) screw threads at one end of the first shank portion integral therewith for engaging the distal fragment;

(C) the second element having

(1) a second shank portion in the form of a sleeve, free of threads on its outer surface for engaging the proximal fragment that longitudinally, slidably fits over the first shank portion of the first element, and

(2) a head at an end of the second shank portion remote from the screw threads on the first shank portion for receiving means for turning the screw.

4,940,468

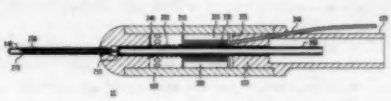
APPARATUS FOR MICROSURGERY

Phillip J. Petillo, 1206 Herbert Ave., Ocean, N.J. 07712

Filed Jan. 13, 1988, Ser. No. 143,652

Int. Cl.[5] A61B *17/32*

U.S. Cl. 606—170 **8 Claims**



1. A surgical apparatus for removing tissue which comprises:

a first tube having an aperture in a sidewall;

a second tube having at least one portion disposed within the first tube and having a sharp end and another end for applying a vacuum thereto;

an electromagnetic drive means for reciprocating the second tube within the first tube so that at least a portion of the sharp end of the second tube moves across the aperture to thereby cut tissue which extends through the aperture, the electromagnetic means comprising:

(a) a chamber;

(b) generating means, disposed within the chamber, for providing a magnetic field in response to the application of electrical current thereto;

(c) magnetic means, affixed to the second tube and being disposed in the chamber, the magnetic means being attracted by the magnetic, field for moving in a first direction when the magnetic field is generated;

(d) the generating means and the magnetic means being further comprised of indexing means for inhibiting rotation of the magnetic means with respect to the generating means and, thereby, for inhibiting rotation of the second tube with respect to the first tube; and

(e) the chamber being further comprised of venting means for releasing air trapped in the chamber;

adjusting means for adjusting the distance of movement of the magnetic means and, thereby, the distance of the movement of the second tube, whereby the opening of the aperture into which the tissue enters the first tube is varied;

said generating means comprises a bobbin having wires wrapped therearound and a passageway disposed therethrough; and

said magnetic means is comprised of a material which is attracted by the magnetic field and the magnetic means has a cross-section whose dimensions are smaller than the dimensions of a cross section of the passageway;

a retaining means, affixed to one end of the magnetic means, and a tension means, disposed between the bobbin and the retaining means, for driving the retaining means and, thereby, the magnetic in a second direction, and

said indexing means comprises guide means, affixed to the bobbin, having a passageway disposed therein and having a groove extending along a portion of the surface of the passageway and a extending means, affixed to the magnetic, disposed to extend into the groove.

4,940,469

LOW-FOAMING COMPOSITION FOR FINISHING SYNTHETIC FIBRES: DYE OR OPTICAL BRIGHTENER OR ULTRA-VIOLET ABSORBER AND ALKYLENE-DIAMIDE:ETHYLENE-DISTEARAMIDE

Reinhart Möckel, Schopfheim-Eichen, Fed. Rep. of Germany, and Roland Putzar, Hefstetten, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jan. 30, 1989, Ser. No. 303,433

Claims priority, application Switzerland, Feb. 8, 1988, 439/88; Nov. 25, 1988, 4385/88

Int. Cl.[5] C09B *67/42;* D06L *3/12;* D06M *13/34;* D06P *1/64*

U.S. Cl. 8—527 15 Claims

1. A composition for finishing synthetic fiber which comprises, based on (a)+(b)+(c),

(a) 15 to 84% by weight of a sparingly water-soluble or water-insoluble dye, fluorescent whitening agent or UV absorber,

(b) 15.5% to 75% by weight of one or more dispersing agents, and

(c) 0.5% to 10% by weight of an aklylenediamide of formula R'—CO—NH—Q—NH—CO—R" (4) wherein R' an R" are each independently of the other an aliphatic radical of 9 to 23 carbon atoms and Q is an alkylene radical of 1 to 8 carbon atoms;

in the substantial absence of silicone and hydrocarbon oils.

4,940,470

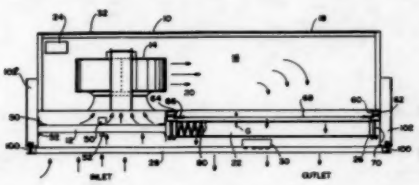
SINGLE FIELD IONIZING ELECTRICALLY STIMULATED FILTER

Raian A. Jaisinghani, Midlothian, and Neville J. Bugli, Richmond, both of Va., assignors to American Filtrona Corporation, Richmond, Va.

Filed Mar. 23, 1988, Ser. No. 172,160

Int. Cl.[5] B03C *3/00*

U.S. Cl. 55—2 31 Claims



1. A method for electrically stimulating a non-conductive dielectric media filter, comprising:

providing a first electrode spaced apart from an upstream face of a non-conductive dielectric pleated flat sheet glass media filter;

holding apart the pleats of said media filter by non-conductive pleat spacing means;

providing a second electrode closely proximate a downstream face of said media filter so as to be in at least loose contact with said downstream face;

drawing intake air through said media filter; and

applying first and second high voltage potentials to the first and second electrodes, respectively, for maintaining a single ionizing and charging electrical field therebetween for ionizing said indrawn air and for charging particles and polarizing the media filter with a differential charge between the upstream and downstream faces thereof.

4,940,471

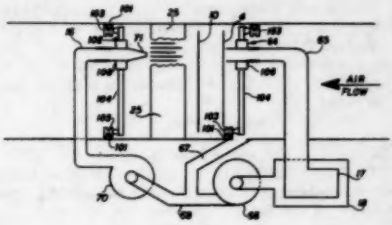
DEVICE FOR CLEANING TWO-STAGE ELECTROSTATIC PRECIPITATORS

Gaylord W. Penney, 216 Paris Rd., Pittsburgh, Pa. 15235

Continuation-in-part of Ser. No. 36,130, Apr. 3, 1987, Pat. No. 4,861,356, which is a continuation-in-part of Ser. No. 735,566, May 17, 1985, abandoned. This application Aug. 25, 1989, Ser. No. 398,483

Int. Cl.[5] B01D *3/00*

U.S. Cl. 55—120 6 Claims



1. A two-stage gas-cleaning precipitator comprising:

(a) an ionizing stage for charging a plurality of particles;

(b) a means for causing a gas to pass first through the ionizing stage and then through a collecting stage, the collecting stage comprising a plurality of alternating high and low voltage collecting plates;

(c) a means for energizing the high voltage plates to create an electric field for precipitating the charged particles; and

(d) a means for cleaning the collecting stage comprising a means for generating a small stream of high velocity gas, a moveable member for directing the small stream of high velocity gas between individual collecting plates to dislodge the collected particles, a means for moving the moveable member over the outlet face of the collecting stage, and a means for conveying the small stream of high velocity gas containing the dislodged particles to a particle collecting means.

4,940,472

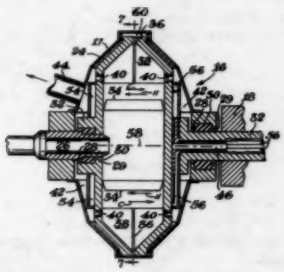
CENTRIFUGAL DEVOLATILIZER

Robert A. Hay, II, Midland, and Albert C. Dowell, Mt. Pleasant, both of Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Jan. 17, 1989, Ser. No. 297,371

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—195 3 Claims



1. Apparatus for the removal of volatile constituents from the product of a polymerization process comprising:

(a) a stationary housing supporting a rotatable annular cham-

ber, said annular chamber having an inlet located substantially along the axis of rotation of said annular chamber, a multiplicity of closely spaced apart barriers forming a multiplicity of fluid flow passages located at a first distance from the axis of rotation of said chamber, and an outlet located at a second distance from the axis of rotation of said chamber, the portion of said chamber located between said passages and said outlet forming an annular pocket;

(b) means for providing a liquid polymer to said inlet;

(c) means to rotate said annular chamber at a speed sufficient to cause said liquid polymer to flow through said passages and said outlet and form liquid seals at each of said passages and said outlet; and

(d) a vacuum source communicating with said annular pocket for removing volatile constituents from said liquid polymer.

4,940,473

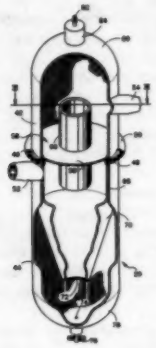
CYCLONE SOLIDS SEPARATOR AND DE-GASIFIER

Roger A. Benham, 4481 Olive Ave., La Mesa, Calif. 92041

Filed Jun. 16, 1989, Ser. No. 367,334

Int. Cl.[5] B01D *19/00*

U.S. Cl. 55—205 **16 Claims**



1. A combination solids separator and de-gasifier for a flowing liquid system comprising:

a generally cylindrical vertically oriented reservoir having a wall separating said reservoir into upper and lower chambers;

a central opening in said wall communicating between said upper and lower chambers;

an inlet into said lower chamber tangential to an outer diameter thereof;

an outlet from said upper chamber;

a gas vent at the top of said reservoir for controllably venting gas from said chamber;

a vortex inducing conical wall extending from said inlet toward the bottom of said reservoir; and

a solids removal port at the bottom of said reservoir.

4,940,474

SUCTION CLEANER

Anders E. C. Larsson, Stockholm; Joakim A. Svanberg, Johanneshov; Lars G. Kilström, Täby, and Lars G. Tuvin, Knivsta, all of Sweden, assignors to Aktiebolaget Electrolux, Stockholm, Sweden

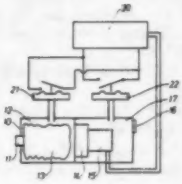
Filed May 11, 1989, Ser. No. 351,077

Claims priority, application Sweden, May 25, 1988, 8801939

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—210 **1 Claim**

1. In a suction cleaner having a housing (10) including an inlet (11) for dust-laden air, a filter chamber (12) with a filter bag (13), a suction fan (14), a motor (15), and an outlet passage (17) through which filtered air flows from said suction fan to an outlet (16), said motor (15) having a control circuit (20) including a first pressure switch (21) communicating with the filter chamber and actuated by the underpressure in the filter chamber to control the motor speed below a predetermined



level, the improvement comprising a second pressure switch (22) communicating with the outlet passage, the second pressure switch (22) being actualable by the pressure in the outlet passage (17) and being connected to the control circuit (20) to limit fan speed when said pressure in the outlet passage exceeds a predetermined level, both of said pressure switches (21, 22) being interconnected in parallel.

4,940,475

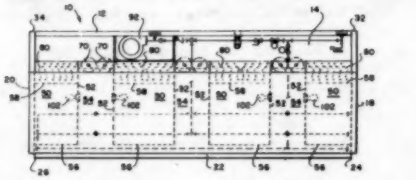
VARIABLE CAPACITY EVAPORATIVE HUMIDIFIER

Ronald J. Yaeger, 5006 Mill Creek, Dallas, Tex. 75244

Filed Sep. 26, 1989, Ser. No. 412,950

Int. Cl.[5] B01F *3/04*

U.S. Cl. 55—224 **5 Claims**



1. A humidifier for adding moisture to a flow of air comprising, in combination:

a housing having inlet, an outlet and a flow passage between said inlet and outlet;

a plurality of evaporative cores mounted adjacent one another within said housing passage, said evaporative cores including core sidewalls defining bypass gaps between said cores;

a pair of bypass damper blades mounted for pivoting movement in each of said bypass gaps between closed and open positions, said bypass damper blades substantially blocking said bypass gaps to the flow of air therethrough in said closed positions and substantially opening said bypass gaps to the flow of air therethrough in said open positions, and said bypass damper blades being selectively positionable at said closed and open positions and at positions intermediate said closed and open positions; and,

a plurality of moisture eliminator walls disposed within said housing, each moisture eliminator wall being angled in the direction of the bypass gap in closest lateral proximity thereto, whereby the flow of air exiting from each evaporative core is intermixed with the flow of air exiting from said bypass gap.

4,940,476

SOOT FILTER

Alfred Buck, Nagolder St. 32, D-7407 Rottenburg 3, Fed. Rep. of Germany, assignor to Alfred Buck, Rottenburg, Fed. Rep. of Germany

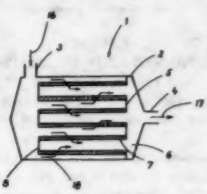
PCT No. PCT/DE88/00586, § 371 Date May 17, 1989, § 102(e) Date May 17, 1989, PCT Pub. No. WO89/02976, PCT Pub. Date Apr. 6, 1989

PCT Filed Sep. 21, 1988, Ser. No. 358,377

Claims priority, application Fed. Rep. of Germany, Sep. 22, 1987, 3731766

Int. Cl.[5] B01D *46/00*

U.S. Cl. 55—486 26 Claims



1. A soot filter (1) disposed in the exhaust gas flow of an internal combustion engine, in particular an air-compressing internal combustion engine, the soot filter having a housing (2) having an inflow pipe and an outflow pipe (3, 4) for the exhaust gas flow, and filter material (11) located in the housing (2) positioned in the path of flow, the filter material (11) comprises at least one layer (14, 15), of circularly knitted fabric (12) essentially consisting of ceramic.

4,940,477

METHOD FOR SYNTHESIZING TOPAZ

Peter L. Bocko, Painted Post; David H. Crooker, Corning, and Lina M. Echeverria, Painted Post, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jul. 19, 1989, Ser. No. 381,813

Int. Cl.[5] C03C *3/118, 17/245*

U.S. Cl. 65—18.2 9 Claims

1. A method for preparing bodies consisting essentially of synthesized fluorine-containing, aluminosilicate crystals having a stoichiometry approximating that of topaz with a fluorine content between 3–21% by weight consisting essentially of the steps of:

(a) generating and supplying to a flame oxidation burner, vapors of a readily-oxidizable compound of silicon and of a readily-oxidizable compound of aluminum and fluorine, in which the fluorine is strongly bonded to the aluminum, said vapors being supplied in separate streams;

(b) injecting the vapors into an oxidizing combustion flame supported by said burner, the two streams of vapors being passed into said flame in separate streams with an interposing fume shield gas stream free of said silicon-containing vapor and of said aluminum-and fluorine-containing vapor being passed into said flame between said two streams;

(c) collecting amorphous fluorine-containing alumino-silicate particles produced from combustion of said two streams of vapors by said flame; and then

(d) sintering said particles into an integral body and concurrently crystallizing it in situ by firing said particles in a fluorine-containing atmosphere at a temperature of 650°–925° C.

4,940,478

METHOD OF MELTING RAW MATERIALS

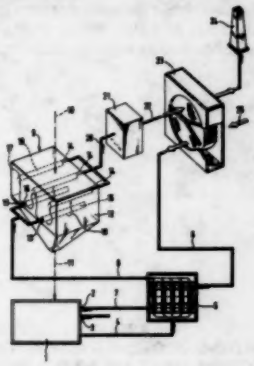
Wilfried Naber, Ladenburg; Heinz-Jürgen Ungerer, Viernheim, and Klaus Sistermann, Neustadt, all of Fed. Rep. of Germany, assignors to Grünzweig & Hartmann AG, Ludwigshafen, Fed. Rep. of Germany

Continuation of Ser. No. 17,147, Feb. 20, 1987, abandoned. This application Sep. 8, 1988, Ser. No. 243,240

Claims priority, application Fed. Rep. of Germany, Feb. 20, 1986, 3605509

Int. Cl.[5] C03B *5/16*

U.S. Cl. 65—27 13 Claims



1. A process of melting raw materials, comprising the steps of:

(a) supplying heat to a melting tank by combustion of fuel;

(b) subjecting combustion air to a second heating process by heat exchange with tank exhaust gases, the combustion air being preheated only to such an extent that the tank exhaust gases are cooled to a temperature substantially equal to but not exceeding the highest permissible temperature which can be withstood by a container containing a mixture of raw materials;

(c) preheating the mixture of raw materials by flowing the tank exhaust gases into direct contact with the mixture of raw materials;

(d) removing acid gaseous aggressive media from the tank exhaust gases; and

(e) subjecting the combustion air to a first heating process by heat exchange with the tank exhaust gases after the acid gaseous aggressive media are removed from the tank exhaust gases.

4,940,479

METHOD FOR MANUFACTURING FLOAT GLASS

Yasuo Sato; Tsunehiro Saito, both of Yokohama; Toshihito Kamioka, Matsudo; Yukio Yoshikawa, Kawasaki, and Masaaki Yoshikawa, Yokohama, all of Japan, assignors to Asahi Glass Company, Ltd., Tokyo, Japan

Filed Aug. 22, 1988, Ser. No. 234,677

Claims priority, application Japan, Aug. 24, 1987, 62-208354

Int. Cl.[5] C03B *18/04, 18/10*

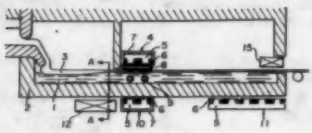
U.S. Cl. 65—99.2 7 Claims

1. A method for manufacturing float glass by continuously supplying molten glass on the surface of a molten metal bath to form a glass ribbon, which comprises:

moving a glass ribbon forward over a moving molten metal bath;

applying a direct current magnetic field to said molten metal bath in a direction to suppress movement of the molten metal bath;

moving said glass ribbon forwardly along the bath surface so as to give said glass ribbon a predetermined thickness; and



cooling said glass ribbon having the predetermined thickness while advancing said glass ribbon on the surface of said molten metal bath controlled by said direct current magnetic field.

4,940,480

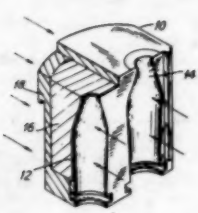
MOLDING COOLING SYSTEM FOR THE MANUFACTURE OF GLASS ARTICLES OR SIMILAR MATERIALS

Alfredo Martinez-Soto, Rincon Colonial; Jorge Loredo-Murphy, Monterrey, and Benito Becerril-Ortega, Puesta Del Sol, all of Mexico, assignors to Vitro Tec Fideicomiso, Monterrey, Mexico

Continuation-in-part of Ser. No. 110,173, Oct. 19, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,820

Int. Cl.[5] **F28D** *21/00, 15/00;* **B29C** *33/02*

U.S. Cl. 65—356 **8 Claims**



1. A glassware forming mold for controlling the heat transference in a glassware forming process, comprising a three-layer construction including first and third bodies, one of which is in contact with a portion of molten glass fed thereto to form a glassware article; and a second central body between said first and third bodies, comprised of a metallic alloy which melts approximately at a temperature between about 375° C. and 550° C. corresponding approximately to a working temperature of the molten glass, providing a solid-liquid state, to control the heat transference from the molten glass to the first or third bodies and from these to the environment during the glass forming process, whereby the glass distribution within the mold is improved;

wherein the material of the second body is selected from alloys of the group consisting of eutectic zinc-base Alloys, Aluminum-base Alloys, Magnesium-base Alloys or mixtures of Ca-Al, Sb-In, Al-Pb, Cu-Mg to promote the liquid-solid phase by reason of their different melting points.

4,940,481

MICROBICIDAL AND GROWTH REGULATING COMPOSITIONS

Urs Müller, Münchenstein; Hans Tobler, Allschwil; Hermann Rempfler, Ettingen, and Alfred Meyer, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Feb. 22, 1983, Ser. No. 468,522

Claims priority, application Switzerland, Mar. 4, 1982, 1329/82-5; Nov. 24, 1982, 6850/82-8

Int. Cl.[5] **C07D** *249/08;* **A01N** *43/653*

U.S. Cl. 71—76 **6 Claims**

1. 1-(4-Chlorophenoxy)-2-tert-butyl-2-hydroxy-3-methyl-3-(1H-1,2,4-triazol-1-yl)propane.

4,940,482

AMINOPYRAZINONES AND AMINOTRIAZINONES OF THE FORMULA

Beat Böhner, Binningen, and Willy Meyer, Riehen, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

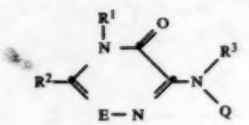
Continuation-in-part of Ser. No. 260,642, Oct. 21, 1988, abandoned, which is a division of Ser. No. 99,036, Sep. 21, 1987, Pat. No. 4,795,486. This application Aug. 15, 1989, Ser. No. 394,389

Claims priority, application Switzerland, Sep. 26, 1986, 3871/86

Int. Cl.[5] **A01N** *43/60, 43/08, 43/10;* **C07D** *241/18, 253/06*

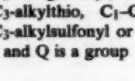
U.S. Cl. 71—92 **16 Claims**

1. An aminopyrazinone of the formula I



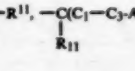
(I)

in which E is $=CR^4-$, R^1 is C_1–C_4-alkyl, R^2 is C_1–C_3-alkyl, C_1–C_3-halogenalkyl, C_1–C_3-alkoxy, C —C-halogenoalkoxy, C_1–C_3-alkylthio, C_1–C_3-alkylsulfinyl, C_1–C_2-alkoxyethoxy, C_1–C_3-alkylsulfonyl or $-NR^5R^6$, R^3 is hydrogen or C_1–C_3-alkyl and Q is a group



in which R^4 is hydrogen, C_1–C_3-alkyl, C_1–C_3-halogenoalkyl, C_1–C_3-alkoxy, cyclopropyl, C_1–C_3-halogenoalkoxy, C_1–C_3-alkylthio, C_2–C_4-alkoxyalkyl, C_3–C_5-dialkoxymethyl, halogen or $-NR^5R^6$, R^5 and R^6 independently of one another are hydrogen or C_1–C_3-alkyl, X is oxygen or sulfur and A is a group

in which Y is oxygen, sulfur, $-CH=CH-$, $-NR^9-$ or $-CR^{10}=N-$, R^7 is hydrogen, halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro or trifluoromethyl, R^8 is hydrogen, halogen, C_1–C_3-alkyl, C_1–C_3-alkoxy, nitro, —C≡CH, or one of the groups



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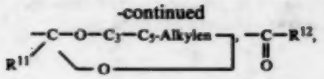

$-SO_2-NR^{13}R^{14}$, $-(Z)_m-R^{15}$ and $-O-SO_2R^{18}$,

R^9 and R^{10} independently of one another are hydrogen, C_1–C_3-alkyl or C_2–C_4-alkenyl, R^{11} is hydrogen, C_1–C_3-alkyl, C_1–C_3-halogenoalkyl, C_3–C_6-cycloalkyl or C_2–C_4-alkoxyalkyl, R^{12} is C_1–C_6-alkoxy, C_3–C_6-alkenyloxy, C_3–C_6-alkinyloxy, C_2–C_6-halogenoalkoxy, C_1–C_4-cyanoalkoxy, C_1–C_6-alkylthio, C_3–C_6-alkenylthio, C_3–C_6alkinylthio, C_5–C_6-cycloalkoxy, C_2–C_6-alkoxyalkoxy or $-NR^{16}R^{17}$, R^{13} is hydrogen, C_1–C_3-alkyl or C_3–C_4-alkenyl, R^{14} is hydrogen, C_1–C_3-alkyl, C_1–C_3-cyanoalkyl or C_1–C_3-alkoxy, R^{15} is C_3–C_6-alkinyl, C_2–C_6-alkenyl, C_1–C_6-alkyl, C_1–C_4-halogenoalkyl, C_2–C_4-halogenoalkenyl or C_1–C_4-alkyl, substituted by cyano, methoxy, ethoxy, nitro, C_1–C_4-alkoxycarbonyl, methylthio, ethylthio, methylsulfonyl or ethylsulfonyl; or C_3–C_4-alkenyl substituted by nitro, cyano, methoxy or ethoxy, R^{16} is hydrogen, C_1–C_3-alkyl or C_3–C_4-alkenyl, R^{17} is hydrogen, C_1–C_3-alkyl, C_1–C_3-cyanoalkyl or C_1–C_3-alkoxy, R^{18} is C_1–C_3-alkyl and C_1–C_3-halogenoalkyl, W is oxygen or sulfur, Z is oxygen, sulfur, —SO— or —SO_2— and m is the number zero or one, or a salt of one of these compounds

15. 3-[3-(2-methoxycarbonylphenylsulfonyl)-ureido]-1,5,6-trimethylpyrazin-2-one.

16. 3-[3-(2-methoxycarbonylphenylsulfonyl)-ureido]-1,6-dimethylpyrazin-2-one

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4,940,483

FUNGICIDAL 2-(-3-PYRIDYL)-1,3-DIOXANES

Yoshio Kurahashi; Toshio Goto; Kunihiro Isono, all of Tokyo; Yoshinori Kitagawa, Tochigi; Tetsuji Izumi; Toshihito Kondo, both of Tokyo, and Takayo Sato, Gunma, all of Japan, assignors to Nihon Tokushu Noyaku Seizo K.K., Tokyo, Japan

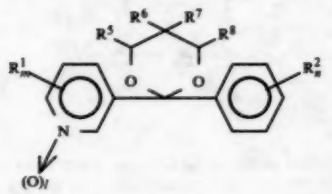
Filed Nov. 8, 1988, Ser. No. 268,913

Claims priority, application Japan, Nov. 10, 1987, 62-282211; May 30, 1988, 62-130168

Int. Cl.[5] C07D *405/06*; A01N *43/40*

U.S. Cl. 71—94 **13 Claims**

1. A 3-substituted pyridine of the formula



wherein

R^1 represents hydrogen, halogen, alkyl or haloalkyl having 1 to 4 carbon atoms,

R^2 represents hydrogen, halogen, alkyl or haloalkyl having 1 to 4 carbon atoms, or phenyl or phenoxy,

l is 0 or 1,

m is an integer from 1 to 4,

n is an integer from 1 to 5, and

R^5, R^6, R^7 and R^8 each represent hydrogen, or alkyl or having 1 to 4 carbon atoms.

9. A method of combating fungi which comprises applying to such fungi or to a fungus habitat a fungicidally effective amount of a compound according to claim 1.

4,940,484

HERBICIDAL METHOD COMPRISING THE USE OF DIFLUFENICAN

Richard H. Hewett, Thaxted, and Brian M. Luscombe, Chelmsford, England, assignors to May and Baker Limited, Dagenham, United Kingdom

Filed Jul. 17, 1987, Ser. No. 74,872

Claims priority, application United Kingdom, Jul. 21, 1986, 8617741

Int. Cl.[5] A01N *43/40, 37/38*

U.S. Cl. 71—94 **7 Claims**

1. A method of controlling the growth of the weeds *Stellaria media* and *Galium aparine* at a cereal locus which comprises applying to the locus an effective amount of the combination of (a) diclofop-methyl, which is the methyl ester of (R,S)-2-[4-1(2,4-dichlorophenoxy)phenoxy]propionic acid, and (b) diflufenican which is N-(2,4-difluorophenyl)-2(3-trifluoromethylphenoxy) nicotinamide.

4,940,485

HERBICIDAL 3-METHYLPHTHALIMIDES

Beat Böhner, Binningen; Hans Moser, Magden, both of Switzerland, and Georg Pissiotas, Lörrach, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

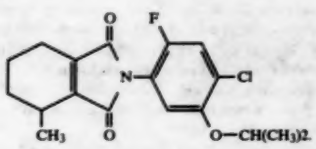
Continuation-in-part of Ser. No. 88,750, Aug. 24, 1987, abandoned. This application Nov. 28, 1988, Ser. No. 277,090

Claims priority, application Switzerland, Sep. 3, 1986, 3538/86

Int. Cl.[5] A01N *43/38*; C07D *209/48*

U.S. Cl. 71—96 **6 Claims**

1. The compound of the formula



4. A method for the selective pre- or post-emergence control of weeds in crops of useful plants which comprises applying to the crop area a herbicidally effective amount of the compound according to claim 1.

4,940,486

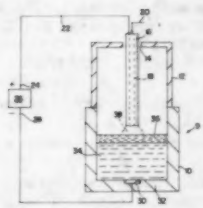
PROCESS FOR TREATING LIQUID METALS

Iain D. Sommerville, Oakville, and Francis L. Kemeny, Pickering, both of Canada, assignors to The University of Toronto Innovations Foundation, Canada

Continuation-in-part of Ser. No. 54,341, May 26, 1987. This application May 8, 1989, Ser. No. 348,857

Int. Cl.[5] C22B *4/00*

U.S. Cl. 75—10.19 **15 Claims**



1. A process for treating metal, comprising the steps of applying a positive DC potential to a slag layer disposed on the surface of a liquid metal melt to provide a plasma phase above

the slag layer and induce a flow of electrons from the melt through the slag layer toward the plasma phase, and introducing to the plasma phase a substance capable of reacting with the species being released at the slag layer/plasma phase interface.

4,940,487

PROCESS FOR UTILIZING OF ZINC-CONTAINING METALLURGICAL DUSTS AND SLUDGES

Walter Lugscheider, Graz, and Lucian Pochmarski, Leoben, both of Austria, assignors to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H., Leoben-Donawitz, Austria

Filed Apr. 5, 1989, Ser. No. 333,232
Claims priority, application Austria, Apr. 8, 1988, 925/88
Int. Cl.[5] C22B 7/02
U.S. Cl. 75—384 11 Claims

1. A process for utilizing a zinc-containing by-product comprising at least one of zinc-containing metallurgical dust and zinc-containing metallurgical sludge derived from a steel-making process and containing at least 30 percent total metallic constituents by weight, essentially including iron and zinc, said process comprising:

(a) providing a converter adapted to accept a charge of metallic material, apply heat such as to melt at least some of said charge by combustion of a fuel, and thereby produce as an output molten metal, slag and a metallurgical dust, in a melting process;

(b) charging said converter with an iron-containing metallized charge;

(c) accepting a supply of said zinc-containing by-product;

(d) analyzing the accepted zinc-containing by-product for carbon content and, if said carbon content lies outside the range of 20 to 25 percent by weight, adjusting said carbon content to lie within said range;

(e) agglomerating said zinc-containing by-product into agglomerates which are constituted by at least one of briquettes and pellets;

(f) further charging said converter with said agglomerates in an amount of 2 to 8 percent by weight of said iron-containing metallized charge; and

(g) conducting said melting process in said converter and thereby obtaining in said metallurgical dust from said converter a constant rich in metallic zinc.

4,940,488

METHOD OF SMELTING REDUCTION OF ORES CONTAINING METAL OXIDES

Takuya Maeda; Keikichi Murakami; Tsutomu Yamada, all of Kobe; Mitsuharu Kishimoto, Hyogo, and Kenichi Yajima, Kobe, all of Japan, assignors to Kawasaki Jukogyo Kabushiki Kaisha, Hyogo, Japan

Continuation-in-part of Ser. No. 278,203, Nov. 30, 1988, abandoned. This application Sep. 1, 1989, Ser. No. 403,058
Claims priority, application Japan, Dec. 7, 1987, 62-310117; Dec. 8, 1987, 62-310143
Int. Cl.[5] C21B 11/00
U.S. Cl. 75—500 8 Claims

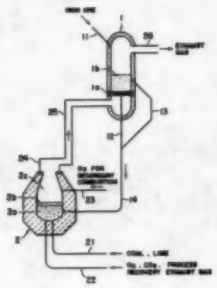
1. A method of smelting reduction of iron oxide ore, comprising the steps of:

prereducing said ore in a solid state in a prereduction furnace;

thereafter melting said ore and carrying out final reduction thereof in a smelting reduction furnace to generate a gas having a reductive capability in the smelting reduction furnace;

subjecting said gas to a secondary combustion at a combustion rate of 25% or more in the smelting reduction furnace;

introducing the gas thus subjected to the secondary combustion into said prereduction furnace; and



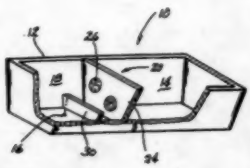
controlling the rate of prereducing said ore in said prereduction furnace to be maintained at a value smaller than 30 percent.

4,940,489

MOLTEN METAL FILTRATION SYSTEM AND PROCESS

Michael A. Cummings, Taylors, S.C., assignor to Alusuisse-Lonza Services Ltd., Zurich, Switzerland

Filed Mar. 30, 1989, Ser. No. 330,612
Int. Cl.[5] C21C 7/00; B01D 35/02
U.S. Cl. 75—407 11 Claims



1. An improved molten metal filtration system comprising:

a filter chamber having a molten metal inlet and a molten metal outlet defining a molten metal flow path therebetween;

a filter assembly disposed between said inlet and said outlet;

said filter assembly including at least one porous ceramic foam filter member seated in a solid plate-like member;

means for preventing molten metal used to initially prime said at least one filter member in said filter assembly from proceeding directly to said outlet and for collecting said priming molten metal so as to form a pool of heated molten metal downstream of said filter assembly for reducing the cooling effect caused by passage of said molten metal through said at least one filter member; and

said preventing means being positioned intermediate said filter assembly and said molten metal outlet.

4,940,490

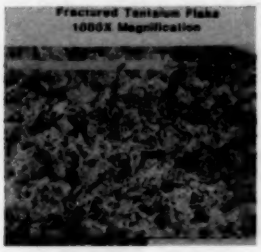
TANTALUM POWDER

James A. Fife, Douglassville, and Marlyn F. Getz, Barto, both of Pa., assignors to Cabot Corporation, Waltham, Mass.

Continuation-in-part of Ser. No. 126,706, Nov. 30, 1987, abandoned. This application Jun. 21, 1988, Ser. No. 209,746

Int. Cl.[5] B22F 1/00

U.S. Cl. 75—229 28 Claims



1. A flaked tantalum powder produced from a tantalum powder prepared by a chemical reduction process comprised of flakes and having a Scott density greater than about 18 g/in^3.

4,940,491

COMPOSITION FOR THE PAINT DETACKIFICATION FOR BOTH WATERBORNE AND SOLVENT ENAMELS

Shu-Jen Huang, Naperville, and David W. Scheimann, Addison, both of Ill., assignors to Nalco Chemical Company, Naperville, Ill.

Division of Ser. No. 312,795, Feb. 21, 1989, Pat. No. 4,888,386. This application Sep. 11, 1989, Ser. No. 405,782

The portion of the term of this patent subsequent to Dec. 20, 2005, has been disclaimed.

Int. Cl.[5] C02F 1/56

U.S. Cl. 134—38 1 Claim

1. The method for detackifying paint in a paint spray booth conprising the steps of dosing a paint spray booth collection system with at least 25 ppm of a composition consisting of a melamine-formaldehyde polymer (A), polyvinyl alcohol (B), and a styrene acrylate copolymer (C), combined in a weight ratio of A:B:C, being within the range of 2:1:1 to 4:5:1.

4,940,492

COLORANT MIXTURES CONTAINING ISOQUINOLINE DERIVATIVES, USE THEREOF IN PRINTING INKS, AND NOVEL ISOQUINOLINE DERIVATIVES

Heinrich Kowarsch, Oberderdingen, and Johannes P. Dix, Neuhofen, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

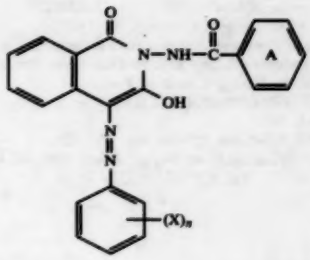
Filed Jun. 22, 1988, Ser. No. 209,586

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721498

Int. Cl.[5] C09B 29/44, 67/20, 67/22; C09D 11/00

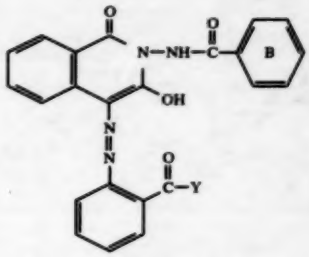
U.S. Cl. 106—494 10 Claims

1. A colorant mixture containing an isoquinoline-azo pigment of the formula I



(I)

wherein X is chlorine, bromine, C_1–C_4 alkoxy or nitro; n is 1,2 or 3; and an isoquinoline-azo dye of formula



(II)

wherein Y is C_6–C_{20}-alkoxy or C_6–C_{20} alkoxy which contains one or more ether linkages.

4,940,493

ALUMINUM CLEANING COMPOSITION AND PROCESS

Fred Neidiffer, P.O. Box 1650, Rancho Mirage, Calif. 92270; Charles E. Fox, and Patsy E. Fox, both of Rte. #1, Box 87, Durant, Iowa 52747

Filed Sep. 30, 1988, Ser. No. 251,299

Int. Cl.[5] C23G 1/02

U.S. Cl. 134—3 21 Claims

1. A process for cleaning debris from the surface of an aluminum-containing article comprising:

contacting a debris-laden aluminum-containing article with a composition at conditions effective to do at least one of the following: (1) remove at least a portion of said debris from said aluminum-containing article and (2) condition at least a portion of said debris for removal from said aluminum-containing article, said composition comprising water, at least one tartaric component selected from the group consisting of racemic tartaric acid, salts of racemic tartaric acid and mixtures thereof in an amount effective to at least facilitate at least one of said removal of said debris and said conditioning of said debris, at least one acidic component in an amount effective to increase the solubility of said tartaric component in said composition, and at least one surface active component in an amount effective to enhance at least one of said removal of said debris and said conditioning of said debris, said contacting occurring substantially without etching said aluminum-containing article; and

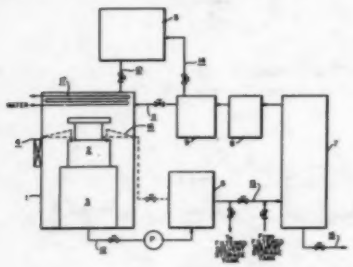
recovering said aluminum-containing article having at least a portion of said debris removed therefrom.

4,940,494

PROCESS AND EQUIPMENT FOR CLEANING LARGE ELECTROMECHANICAL PARTS

Nicaise Petit, Rousset, and Jean-Claude Moisset, Faverges, both of France, assignors to Snef Electro Mecanique, Vitrolles and Techni Contact, Faverges, both of, France

PCT No. PCT/FR84/00168, § 371 Date Mar. 5, 1985, § 102(e) Date Mar. 5, 1985
PCT Filed Jul. 6, 1984, Ser. No. 708,512
Claims priority, application France, Jul. 6, 1983, 83 401390
Int. Cl.[5] B08B 3/10
U.S. Cl. 134—1 9 Claims



9. A process for cleaning a soiled rotor of a dynamoelectric machine, the insulating resistance of the soiled rotor between the windings and the ground being significantly lower than its rated value, comprising the steps of:

placing the rotor on a support in a treatment tank,

introducing a fluoro containing halogenated hydrocarbon into the tank until the rotor is submerged,

heating the fluoro containing halogenated hydrocarbon to a temperature of about 30° C.,

applying a magnetostrictive ultrasonic energy having a frequency of about 20 kHz, while continuously measuring the value of the rotor insulation resistance,

stopping the application of the ultrasonic energy when the insulation resistance measured reaches a value equal or close to its rated value, and

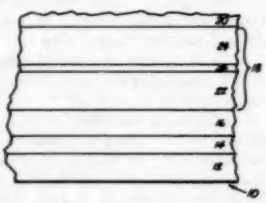
removing the rotor from the tank.

4,940,495

PHOTOVOLTAIC DEVICE HAVING LIGHT TRANSMITTING ELECTRICALLY CONDUCTIVE STACKED FILMS

Michael F. Weber; Nang T. Tran; Frank R. Jeffrey; James R. Gilbert, and Frank E. Aspen, all of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, Saint Paul, Minn.

Filed Dec. 7, 1988, Ser. No. 280,838
Int. Cl.[5] H01L 31/06, 23/48
U.S. Cl. 136—256 18 Claims



13. A photovoltaic device comprising:

a semiconductor layer having a first side and a second side;

a first electrode in electrical contact with the second side of the semiconductor layer; and

a light transmitting top electrode contacting the first side of the semiconductor layer and including a first light transmitting electrically conductive layer in electrical contact with the first side of the semiconductor layer, the first layer having a first optical thickness, and a second light transmitting layer, having a second optical thickness different from the optical thickness of the first layer;

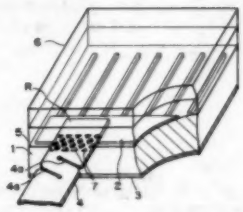
and an electrically conductive metallic layer interposed between and in electrical contact with the first and second layers.

4,940,496

SOLAR BATTERY DEVICE

Hideo Matsumoto; Katsumi Sato, and Shigeru Hokuyo, all of Itami, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jan. 13, 1989, Ser. No. 296,698
Claims priority, application Japan, Feb. 3, 1988, 63-024292
Int. Cl.[5] H01L 31/05
U.S. Cl. 136—256 2 Claims



1. A solar battery device comprising:

a solar battery element having a light receiving surface for receiving light and provided with an electrode on a region thereof;

an interconnector having an end portion connected to a surface of said electrode and a stress relief portion close to said end portion;

an adhesive layer provided on said light receiving surface, the surface of said electrode, and said end portion of said interconnector;

a transparent cover disposed on said adhesive layer and joined with said light receiving surface, the surface of said electrode, and said end portion of said interconnector by means of said adhesive layer; and

at least one through hole provided in a region of said interconnector intermediate said end portion and said stress relief portion for limiting outflow of said adhesive layer;

the minimum distance between an edge of said solar battery element and said stress relief portion being greater than the maximum distance between any of said at least one through hole and said edge of said solar battery element.

4,940,497

EMULSION EXPLOSIVE COMPOSITION CONTAINING EXPANDED PERLITE

Catharine L. VanOmmeren, New Tripoli, Pa., assignor to Atlas Powder Company, Dallas, Tex.

Filed Dec. 14, 1988, Ser. No. 284,076
Int. Cl.[5] C06B 45/00
U.S. Cl. 149—2 20 Claims

1. A water-in-oil emulsion explosive composition comprising:

a continuous phase consisting of a carbonaceous fuel component and emulsifier;

a dispersed phase consisting of an aqueous solution of inorganic oxidizer salt(s); and

a void-providing agent consisting of expanded perlite having a density of less than 0.60 g/cc.

4,940,498

FLUX COMPOSITION

Wallace Rubin, Northwood, Great Britain, assignor to Multicore Solders Limited, Hertfordshire, United Kingdom

Filed Aug. 14, 1989, Ser. No. 393,647

Int. Cl.[5] B23K *35/34*

U.S. Cl. 148—23 10 Claims

1. In the formation of soldered joints during the production of printed circuit board assemblies by the use in combination of a soft solder and a non-corrosive liquid flux, the improvement which comprises obtaining substantially no or only minimal residues from the soldering operation by utilising as the liquid flux a non-corrosive organic flux material dissolved in an organic solvent mixture comprising a major proportion by weight of a monohydric alcohol and a minor proportion by weight of a water-immiscible ether selected from polyalkylene glycol dialkyl ethers and polyalkylene glycol diaryl ethers, thereby obviating the need for a cleaning step after the soldering operation.

4,940,499

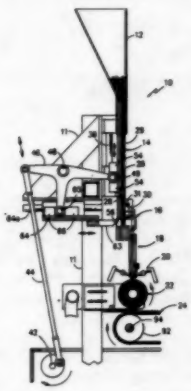
METHOD AND APPARATUS FOR SEALING CAPSULES CONTAINING MEDICAMENTS

Jean C. Lebrun; Jeffrey L. Kaltz, both of Greenwood, and Pressley A. Love, Ninety Six, all of S.C., assignors to Warner-Lambert Company, Morris Plains, N.J.

Filed May 23, 1989, Ser. No. 356,046

Int. Cl.[5] B65B *7/28*

U.S. Cl. 156—69 13 Claims



1. A method of sealing gelatin capsules, each having a generally cylindrical cap and body arranged with the side wall of the body telescopically received within the side wall of the cap to contain a medicament therein, comprising the steps of moving a plurality of capsules in longitudinal endwise abutment along a path of travel for treatment with the capsules initially positioned randomly cap-first and body-first in their direction of movement, sequentially orienting each capsule in the path to position the capsule with its longitudinal axis substantially vertical and cap down, applying a metered amount of a wetting fluid against the side wall of the body of each capsule adjacent the seam of the juncture of the side walls of its body and cap to distribute wetting fluid by capillary action and under influence of gravity into the area between the telescoped walls of the cap and body, and delivering each wetted capsule along the path for further treatment.

4,940,500

FILTER MEDIUM FORMING SYSTEM AND PROCESS

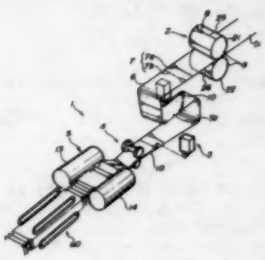
Shigeo Tadokoro, Kawagoe; Joji Morioka, Saitama, and Hideyuki Takahashi, Wako, all of Japan, assignors to Tsuchiya Mfg. Co., Ltd., Tokyo, Japan

Filed Aug. 25, 1988, Ser. No. 236,376

Claims priority, application Japan, Aug. 31, 1987, 62-215227; Aug. 31, 1987, 62-215228; May 31, 1988, 63-11669

Int. Cl.[5] B31F *1/10*

U.S. Cl. 156—204 30 Claims



28. A filter medium forming process for preparing a pleated filter medium having a plurality of pleats, the plurality of pleats defining adjacent pair of first and second pleats, each pleat having first and second sides which are integrally connected through a first linear depression with each other to form an upwardly-pointing pleat portion, the second side of the first pleat and the first side of the second pleat being integrally connected through a second linear depression with each other to form a downwardly-pointing pleat portion, each pleat side having oppositely located first and second edge sections which have first and second edges, respectively, which extend substantially perpendicular to each linear depression, the first edge sections of the first and second sides of each pleat being approached and bonded to each other to form a plurality of first bonded sections, the second edge section of the first pleat second side and the second edge section of the second pleat first side, of the adjacent pairs of first and second pleats, being approaches and bonded to each other to form a plurality of second bonded sections,

said filter medium forming process comprising the steps, in the sequence as set forth, of forming the first and second linear depressions, applying adhesive onto the first and second edge sections of the first and second edge sections of the first and second sides, pleating the filter medium along the first and second liner depressions, and tightly contacting the edge sections of the first and second pleat sides to bond the edge sections.

4,940,501

METHOD OF MANUFACTURING A PERFORATED ROOFING MATERIAL

Jan Hollander, Zuidhorn, Netherlands, assignor to B. V. Asphalt- en Chemische Fabrieken Smid & Hollander, Netherlands

Continuation of Ser. No. 148,452, Jan. 26, 1988, abandoned, which is a division of Ser. No. 880,418, Jun. 30, 1986, abandoned. This application Aug. 17, 1989, Ser. No. 395,300

Claims priority, application Netherlands, Jul. 1, 1985, 8501890

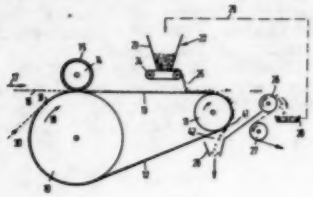
Int. Cl.[5] B32B *31/14*

U.S. Cl. 156—252 12 Claims

1. A method of manufacturing a web-like roofing material of the type having perforations sized to permit a fluidized bend-

ing agent to pass freely therethrough when bonding the roofing material to a roofing surface, comprising the following steps:

forming a non-stick surface on one side of the web material;



covering the other side of the web material with a metal foil so to cover the perforations; and

removing the metal foil covering the perforations.

4,940,502

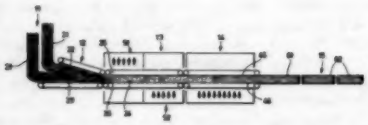
RELATING TO BONDED NON-WOVEN POLYESTER FIBER STRUCTURES

Ilan Marcus, Versoix, Switzerland, assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 921,644, Oct. 21, 1986, Pat. No. 4,794,038, which is a continuation-in-part of Ser. No. 734,423, May 15, 1985, Pat. No. 4,618,531. This application Dec. 27, 1988, Ser. No. 290,385

Int. Cl.[5] B32B *31/20*

U.S. Cl. 156—272.2 **5 Claims**



1. A continuous process for making a molded block of bonded polyester fiber having a cross-section of predetermined dimensions from fiberballs consisting essentially of a blend of polyester fiber with binder fiber, characterized in that said fiberballs are formed into a shaped mass, that has a cross-section with a dimension that is larger than one of said predetermined dimensions, and that is continuously advanced through a compressing stage, in which said mass is compressed transversely, and wherein said binder fiber is activated and caused to bond the polyester fiber by first heating and then cooling the mass while said mass is maintained in compressed condition.

4,940,503

PROCESS FOR THE PRODUCTION OF AN ABRASION RESISTANT DECORATIVE THERMOSETTING LAMINATE

Kent O. Lindgren; Sven E. Danielsson; Tommy M. Johnsson, all of Perstorp, and Nils-Joel A. Nilsson, Hässleholm, all of Sweden, assignors to Prestorp AB, Perstorp, Sweden

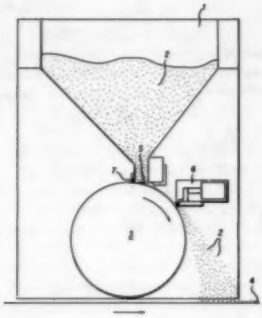
Filed Feb. 17, 1989, Ser. No. 311,955

Claims priority, application Sweden, Feb. 18, 1988, 8800550

Int. Cl.[5] B32B *31/12*

U.S. Cl. 156—279 **21 Claims**

1. Process for the production of a decorative thermosetting laminate with an abrasion-resistant surface layer, said laminate comprising paper sheets impregnated with a thermosetting resin, said process comprising impregnating a continuous paper with a thermosetting resin, and having the surface of the paper wetted with said resin coating at least one side of the continuous paper with 2–20 g/m^2 of small, dry and hard particles so that said particles are evenly distributed over the surface of resin on the continuous paper, then drying the resin with the particle coated thereon, cutting the particle coated



impregnated paper into sheets, placing at least one such paper sheet as a surface layer on a base layer and bonding the surface layer to the base layer.

4,940,504

APPARATUS FOR EXTRUSION

Ralph E. Starnes, Jr., Carrollton, Ga., assignor to Southwire Company, Carrollton, Ga.

Continuation-in-part of Ser. No. 12,586, Feb. 9, 1987, Pat. No. 4,773,954. This application Sep. 6, 1988, Ser. No. 240,324

The portion of the term of this patent subsequent to Sep. 27, 2005, has been disclaimed.

Int. Cl.[5] B29B *47/02*

U.S. Cl. 156—500 **5 Claims**

1. Apparatus for extruding a coating of two layers of dissimilar plastic compounds having substantially different melting points onto an electrical conductor, said apparatus having:

a segmented head having first and second segments and having enlarged first and second end openings connected by a main axial bore smaller than the diameter of said end openings to provide inwardly disposed annular shoulders at the base of said openings, said bore extending through said first and second segments;

a first passageway in said first segment for applying the plastic composition which forms the inner layer of said coating of said electrical conductor;

a second passageway in said second segment for applying the plastic composition which forms the outer layer of said coating of said electrical conductor;

segmented internal tooling having first and second segments for guiding and applying the plastic compositions which form the inner and outer layers of said coating of said conductor, said tooling having a plurality of segments and having first and second end openings connected by a main axial bore, said bore extending through said plurality of segments;

a means for passing an electrical conductor through said axial bore of said internal tooling;

a means interposed between said first and second internal tooling segments for thermally isolating said first segment from said second segment;

a heatsink means interposed between said first and second internal tooling segments for removing excess heat flow-

ing from the segment through which passes the higher melting point plastic composition and from the plastic composition flowing through said segment;

a means for monitoring the temperature in said first and said second internal tooling segments;

a guide means for maintaining the position of said electrical conductor within said main axial bore of said segmented internal tooling while said coating is applied to said conductor, said guide means having a trimming insert means and said insert having a first or entrance end and a second or exit end connected by an axial bore adopted to align with the axis of said main axial bore when adjustably positioned within the axial bore of said segmented tooling;

said guide means having a tensioning means to apply force to said insert counter to the direction of movement of said electrical conductor through said segmented head whereby said electrical conductor is held in a constant position relative to the axial bore of said segmented head and said first and second passageways and;

said guide means having a securing means to secure said trimming insert to said segmented head, THE IMPROVEMENT WHICH COMPRISES:

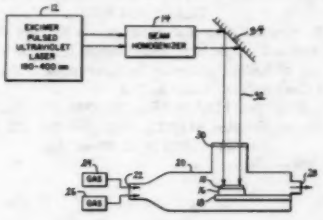
replaceable tip attached to the second or exit end of said trimming insert means.

4,940,505

METHOD FOR GROWING SINGLE CRYSTALLINE SILICON WITH INTERMEDIATE BONDING AGENT AND COMBINED THERMAL AND PHOTOLYTIC ACTIVATION

Steven R. Schachameyer, Whitefish Bay, and Mark W. Beranek, Grafton, both of Wis., assignors to Eaton Corporation, Cleveland, Ohio

Filed Dec. 2, 1988, Ser. No. 279,566
Int. Cl.[5] H01L *21/205*
U.S. Cl. 156—612 **9 Claims**



1. A method for epitaxially growing single crystalline silicon on a silicon substrate from a silicon-bearing gas at a temperature below the pyrolytic threshold of said silicon-bearing gas, comprising:

providing a silicon substrate exposed to ambient to have an oxide layer thereon;

removing the oxide layer and substituting therefore a first intermediate bonding agent bonding with silicon atoms in the substrate in place of oxygen;

removing said first bonding agent and substituting therefore a second bonding agent bonding with silicon atoms in said substrate in place of said first bonding agent;

removing said second bonding agent in the presence of silicon-bearing gas and substituting atomic silicon from said gas for said second bonding agent to bond with silicon atoms in said substrate and epitaxially grow single crystalline silicon on said substrate;

wherein:

said step of removing said first bonding agent and substituting therefore said second bonding agent is photolytically activated comprising applying laser radiation against said substrate;

said step of removing said second bonding agent and substituting therefore atomic silicon from said silicon-bearing gas is both thermally and photolytically activated comprising in combination heating said substrate and applying laser radiation against said substrate;

and comprising:

after said step of removing said oxide layer and substituting therefore said first bonding agent, exposing said substrate to ambient such that another layer of oxide forms thereon;

removing said other oxide layer during said step of removing said first bonding agent and substituting therefore said second bonding agent by said photolytic activation;

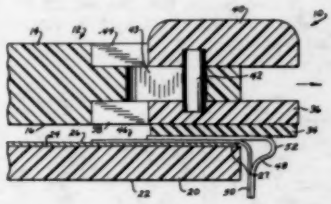
without exposing said substrate to ambient, continuing the process by removing said second bonding agent and substituting therefore said atomic silicon from said silicon-bearing gas by said combined thermal and photolytic activation.

4,940,506

DEVICE FOR USE WITH SELF-ADHESIVE REMOVABLE LABELS

Ronald O. Krause, Appleton, Wis., assignor to MEI Services, Inc., Menasha, Wis.

Filed Feb. 13, 1989, Ser. No. 310,237
Int. Cl.[5] B32B *31/16*
U.S. Cl. 156—584 **11 Claims**



1. A device for separating a self-adhesive removable label from its support paper, said device comprising:

a first elongated member having a label gripping surface disposed at a first end,

a second elongated member having a support paper gripping surface disposed at a first end

said first and second members pivotally connected at a second end, and

operating means for moving said label gripping surface relative to said support paper gripping surface along a line substantially parallel to said gripping surfaces while said gripping surfaces are in engagement with the label and the support paper so that the label is moved relative to the support paper and the process of removing the label from the support paper is initiated.

4,940,507

LAPPING MEANS AND METHOD

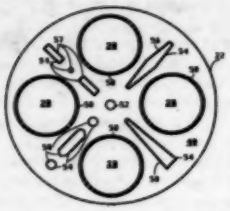
Josephine Harbarger, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Oct. 5, 1989, Ser. No. 417,405
Int. Cl.[5] B44C *1/22*; H01L *21/306*; C03C *15/00, 25/06*
U.S. Cl. 156—636 **20 Claims**

1. A process for treating major faces of thin wafers, comprising:

providing a lapping plate of a pre-determined thickness and having multiple wafer holes extending therethrough adapted to receive the thin wafers with their major faces approximately parallel to major faces of the lapping plate, and having multiple slurry holes extending therethrough, wherein the slurry holes are located between the wafer holes and spaced apart therefrom;

placing the lapping plate between platens of a polishing apparatus and wafers in the wafer holes; and



rotating the lapping plate while feeding a slurry thereto so that the slurry penetrates the slurry holes to come into contact with lower faces of the wafers.

4,940,508

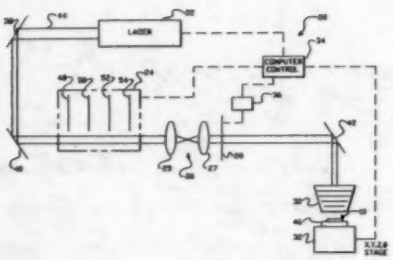
APPARATUS AND METHOD FOR FORMING DIE SITES IN A HIGH DENSITY ELECTRICAL INTERCONNECTING STRUCTURE

Shamouil Shamouilian, and Paul N. Ludwig, both of Santa Clara, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Jun. 26, 1989, Ser. No. 371,211

Int. Cl.[5] B44C *1/22*; B23K *26/00*; B29C *37/00*

U.S. Cl. 156—643 **34 Claims**



22. A method for removing material from a structure, comprising:

supporting the structure on a stage moveable in at least the x and y directions;

providing an aperture means having a plurality of openings of different sizes and shapes; and

actuating an excimer laser and directing a laser beam through at least a selected one of said openings to remove material from said structure by ablative photodecomposition.

4,940,509

ISOTROPIC ETCHANT FOR CAPPED SILICIDE PROCESSES

Stephen T. Tso, Dallas; David L. Bouldin, Allen; Mark R. Calley, Dallas, and Charlotte M. Tipton, Allen, all of Tex., assignors to Texas Instruments, Incorporated, Dallas, Tex.

Filed Mar. 25, 1988, Ser. No. 173,513

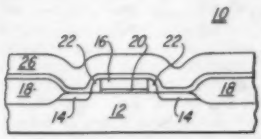
Int. Cl.[5] C03C *15/00*; C23F *1/02*; C09K *13/00*

U.S. Cl. 156—653 **5 Claims**

1. A method for removing silicon nitride from a substrate having silicon nitride and titanium silicide formed thereon comprising the steps of:

providing a substrate with titanium silicide and silicon nitride formed thereon;

exposing said substrate to phosphoric acid having a sufficient concentration and temperature for removing said silicone nitride without adversely affecting said titanium silicide so as to etch at least a portion of said silicone



nitride, said etching of said silicone nitride occuring at a faster rate than said phosphoric acid etches said titanium silicide.

4,940,510

METHOD OF ETCHING IN THE PRESENCE OF POSITIVE PHOTORESIST

Roy J. Burt, Sunnyvale, Calif., assignors to Digital Equipment Corporation, Maynard, Mass.

Int. Cl.[5] C23F *1/00*; B44C *1/22*

U.S. Cl. 156—656 **10 Claims**

1. A method for etching chromium in the presence of positive photoresist comprising contacting a chromium film which has been patterned with positive photoresist with a solution consisting essentially of about 3 to about 9 grams potassium hydroxide per liter of water and about 15 to about 25 grams potassium permanganate per liter of water.

4,940,511

METHOD FOR MAKING A MAGNETORESISTIVE READ TRANSDUCER

Robert E. Fontana, Jr., San Jose; James K. Howard, Morgan Hill; James H. Lee, and Haralambos Lefakis, both of San Jose, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Division of Ser. No. 173,956, Mar. 28, 1988, Pat. No. 4,879,619. This application May 22, 1989, Ser. No. 355,239

Int. Cl.[5] G11B *5/42*; B44C *1/22*

U.S. Cl. 156—656 **6 Claims**

1. The method for making a magnetoresistive read transducer comprising the steps of:

depositing a thin film of a magnetoresistive conductive layer formed of ferromagnetic material onto a substrate;

depositing a thin film spacer layer onto and in contact with said magnetoresistive layer, said thin film spacer layer comprising a material selected from the group consisting of nichrome and nichrome with chromium oxide; and

depositing a thin film of soft magnetic material onto and in contact with said thin film spacer layer so that said thin film of soft magnetic material is positioned parallel to but spaced from said magnetoresistive layer whereby a transverse bias is produced in at least a part of said magnetoresistive layer and the transverse biased part of said magnetoresistive layer is maintained in a linear response mode.

4,940,512

CROSS-DIRECTIONAL DISTRIBUTION OF ADDITIVES IN SYNTHETIC PAPERS

Gary L. Hendren, and Lee J. Hesler, both of Richmond, Va., assignors to E. I. du Pont de Nemours and Co.ny, Wilmington, Del.

Filed Aug. 18, 1988, Ser. No. 233,634
Int. Cl.[5] D21H *23/02*
U.S. Cl. 162—109 9 Claims

1. A process for making an elongate, nonwoven flexible sheet from synthetic fibrous stocks, said sheet having an additive distributed in a predetermined cross-directional pattern of areas of higher and lower additive quantities across the width of the sheet, said process comprising:

providing at least two synthetic fibrous stocks each containing solids capable of forming an elongated, nonwoven flexible sheet, one of said stocks containing said additive in a concentration higher than in the other stock;

supplying each of said stocks to a paper machine having a headbox for depositing said stocks on a wire to form a wet sheet of said solids, said stocks being introduced into said headbox from a plurality of cross-directional positions equally spaced-apart along said headbox with a generally equal amount of solids being introduced at each position to produce a wet sheet generally uniform in weight per unit of area across its width, said stock with the higher concentration of additive being introduced in higher quantity than the other stock at least at one of said cross-directional positions corresponding to a higher additive quantity area of said sheet so that the additive is distributed in said predetermined cross-directional pattern;

monitoring the weight per unit of area across the width of the wet sheet being produced and controlling the supplying of each of said stocks into said headbox in response to said monitoring of weight per unit of area to maintain the weight per unit of area generally uniform across its width as the sheet is produced; and

dewatering and drying said wet sheet to form said nonwoven sheet.

4,940,513

PROCESS FOR PREPARING SOFT TISSUE PAPER TREATED WITH NONCATIONIC SURFACTANT

Wolfgang U. Spendel, Cincinnati, Ohio, assignor to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 5, 1988, Ser. No. 280,086
Int. Cl.[5] D21H *23/26, 25/04*
U.S. Cl. 162—112 17 Claims

1. A process for making soft tissue paper, said process comprising the steps of:

(a) wet-laying cellulosic fibers to form a web;

(b) applying to said web, at a fiber consistency of from about 10% to about 80%, total web weight basis, a sufficient amount of a water-soluble noncationic surfactant such that from about 0.01% to about 2.0% of said noncationic surfactant, based on the dry fiber weight of said tissue paper, is retained by said web;

(c) applying to said web, at a fiber consistency of from about 10% to about 80%, total web weight basis, a sufficient amount of a starch binder material such that from about 0.01% to about 2.0% of said starch, based on the dry fiber weight of said tissue paper, is retained by said web; and

(d) drying and creping said web;

wherein said tissue paper has a basis weight of from about 10 to about 65 g/m^2 and a density of less than about 0.60 g/cc.

4,940,514

MAKING PAPER, BOARD AND CARDBOARD OF HIGH DRY STRENGTH

Andreas Stange, Mannheim; Hans-Juergen Degen, Lorsch; Werner Auhorn, Frankenthal; Volkmar Weberndoerfer; Michael Kroener, both of Mannheim, and Heinrich Hartmann, Limburgerhof, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

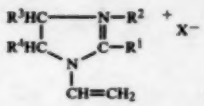
Filed Jul. 25, 1988, Ser. No. 223,334
Claims priority, application Fed. Rep. of Germany, Jul. 25, 1987, 3724646
The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.
Int. Cl.[5] D21H *17/44*
U.S. Cl. 162—168.2 6 Claims

1. A process for making paper, board and cardboard having high dry strength, which comprises adding an aqueous solution of a mixture of enzymatically digested starch having a viscosity of from 20 to 2,000 mPa.s (measured in 7.5% strength aqueous solution at 45° C.) and a cationic polymer which contains, as copolymerized characteristic monomers,

(a) diallyldimethylammonium chloride,

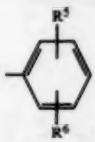
(b) N-vinylamine or

(c) an N-vinylimidazoline of the formula

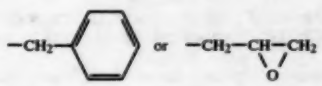


(I)

where R^1 is H, C_1–C_{18}-alkyl or



R^5 and R^6 are each H, C_1–C_4-alkyl or Cl, R^2 is H, C_1–C_{18}-alkyl,



R^3 and R^4 are each H or C_1–C_4-alkyl and X^- is an acid radical, and which has a K value of not less than 30, (determined according to H. Fikentscher in 5% strength aqueous sodium chloride solution at 25° C. and at a polymer concentration of 0.5% by weight), from 1 to 20 parts by weight of one or more cationic polymers being used per 100 parts by weight of enzymatically digested starch, as a dry strength agent to the paper stock and draining the paper stock with sheet formation.

4,940,515

IMBEDDED MESH IN SUCTION BOX COVER

David J. Krebs, East Schodack, N.Y., assignor to Albany International Corp., Menands, N.Y.

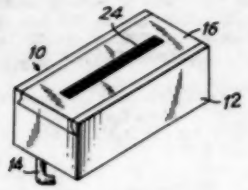
Filed Jun. 28, 1989, Ser. No. 372,883
Int. Cl.[5] D21F *1/52*
U.S. Cl. 162—363 4 Claims

1. In a paper making machine having a press fabric for removing water from a paper sheet, a suction box comprising:

a fixed box body connected to a source of vacuum;

a solid cover secured to said box body and having a substan-

tially flat surface for contacting said press fabric, said surface having a continuous slot with two opposed side walls and a uniform cross-section therebetween, said side walls extending substantially along the width of said press fabric, said slot being in communication with said box



body for removing water from said press fabric by suction; and

a fixed mesh imbedded in said cover and covering said slot for preventing contact between said press fabric and said side walls.

4,940,516

PROCESS FOR THE PREPARATION OF ELECTROACTIVE LANGMUIR-BLODGETT LAYER SYSTEM

Alex Wegmann, Allschwil; Bernd Tieke, Marly, and Bruno Hilti, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Jul. 5, 1989, Ser. No. 375,758

Claims priority, application Switzerland, Jul. 8, 1988, 2617/88

Int. Cl.[5] C25B *3/02*

U.S. Cl. 204—14.1 **6 Claims**

1. A process for the preparation of Langmuir-Blodgett layer systems (LB systems), comprising the steps of

(i) preparing a monomolecular layer of an electroactive compound containing a cyclic conjugated π-system which can be electrochemically oxidised or reduced, or of a mixture of said compound in conjunction with further amphiphilic compounds that are capable of stabilising monomolecular layers,

(ii) transferring said layer from a subphase which contains an electrolyte, and into which a counter electrode is dipped, to a solid substrate having an electrically conductive surface by dipping said substrate through the layer so as to effect transfer of the layer to the substrate which is connected as anode or cathode, the potential applied being so chosen that a salt forms from said electroactive compound and counterions of the subphase.

4,940,517

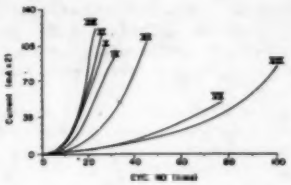
POLYMERIZATION OF ANILINE AND ITS DERIVATIVES

Yen Wei, Philadelphia, Pa., assignor to Drexel University, Philadelphia, Pa.

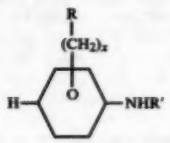
Filed Nov. 10, 1988, Ser. No. 269,857

Int. Cl.[5] C25B *3/02*

U.S. Cl. 204—78 **18 Claims**



1. A method for polymerizing compounds of Formula I:



(I)

wherein R is —H, —OH, lower alkoxy, halogen, —COOH, $—NO_2$ or $—NH_2$; x is 0 to 4, with substitutions being ortho or meta to the amine group; R′ is hydrogen or lower alkyl; comprising reacting the compound of Formula I or a water-soluble salt thereof with an initiator, in the presence of a chemical oxidant and/or an applied electrochemical potential, said initiator comprising a substituted or unsubstituted aromatic amine which has a lower oxidation potential than the compound of Formula I and which is capable of being incorporated into the polymer chain resulting from the polymerization reaction.

4,940,518

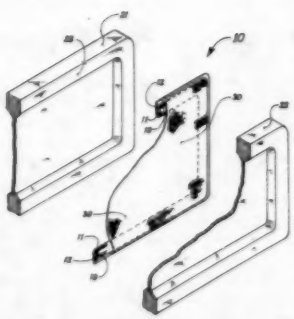
COMBINATION SEAL MEMBER AND MEMBRANE HOLDER FOR A FILTER PRESS TYPE ELECTROLYTIC CELL

Gregory J. E. Morris, Milan, Italy, assignor to The Dow Chemical Company, Midland, Mich.

Filed Sep. 26, 1988, Ser. No. 249,638

Int. Cl.[5] C25B *1/24, 9/00, 13/00*

U.S. Cl. 204—128 **11 Claims**



8. A method of operating an electrolytic cell comprising:

(a) providing a seal member comprising a solid body struc-

ture in a picture frame type configuration having a groove therein forming a U-shaped member when viewed in cross-section, the bottom of the "U" of the U-shaped member forming the inside perimeter surface of the frame configuration and the "arms" of the U-shaped member forming the groove disposed toward the outside perimeter surface of the frame configuration, the groove adapted for holding the edges of a sheet-like member therein:

(b) inserting a sheet-like separator in the groove of the U-shaped seal member;

(c) interposing the seal member with separator between at least a first frame member and a second frame member, the separator spacing apart an anode and a cathode compartments defined by the first and second frame members and the separator;

(d) compressing the seal member with separator and the first and second frame members together;

(e) feeding an aqueous alkali metal halide solution to the electrolytic cell; and

(f) passing an electrical current from the anode to the cathode such that a halide is evolved at the anode.

4,940,519

DETOXIFICATION APPARATUS AND METHOD FOR TOXIC WASTE USING LASER ENERGY AND ELECTROLYSIS

Robert G. Dames, 4444 Green Valley Dr., Arnold, Mo. 63010

Filed Jun. 27, 1988, Ser. No. 211,767

Int. Cl.[5] C02F *1/461, 1/30*

U.S. Cl. 204—130 **16 Claims**

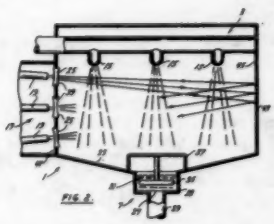


FIG. 2.

1. A method of detoxifying liquid toxic organic waste material by a two step process, the method comprising in a desired order: a first step of subjecting the material to a laser beam by producing a laser beam within a vessel and directing the liquid waste material through the beam as particles, thereby creating sufficiently high temperatures within the material to incinerate the toxic waste, and a second step of electrolyzing said material; and thereafter a step of discharging the detoxified material from the vessel.

6. Detoxification apparatus for safely disposing of liquid toxic organic waste material by a two step process including high temperature incineration and electrolysis, the apparatus comprising: a closed reactive vessel having at least one inlet and at least one outlet; nozzle means for introducing the liquid waste material into the vessel through the inlet as a mist; laser means for producing a laser beam within the vessel, the liquid waste material mist passing through the beam with the beam energy creating sufficiently high temperatures within the waste material mist to incinerate the toxic waste; electrolysis means for electrolyzing the liquid waste material; and egress means for removing detoxified material from the vessel outlet for further processing.

4,940,520

PROCESS FOR THE PREPARATION OF 4-ACYLOXYAZETIDIN-2-ONE BY SINGLET OXYGEN OXIDATION

Joseph E. Lynch, Plainfield, N.J.; William L. Laswell, Perkasie, Pa.; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, both of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

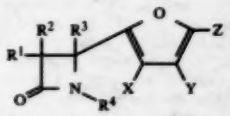
Filed Jun. 21, 1989, Ser. No. 369,155

Int. Cl.[5] B01J *19/08*; C07D *205/02, 205/06*

U.S. Cl. 204—157.71 **16 Claims**

1. A method for the production of 4-acyloxyazetidin-2-ones comprising the steps of:

(a) contacting with singlet oxygen to react at temperatures below about 0° C. in organic solvent a compound of the formula:



wherein R^1 and R^2 are independently selected from the group consisting of hydrogen, C_{1-10} alkyl, C_{1-10} fluoroalkyl, alpha-carbon substituted C_{1-10} alkyl, alpha-carbon substituted C_{1-10} fluoroalkyl, where the alpha-carbon substituent is selected from the group consisting of hydroxyl and protected hydroxyl; R^3 is selected from the group consisting of hydrogen and C_{1-10} alkyl; R^4 is selected from the group consisting of hydrogen and a protecting group for nitrogen; and X, Y and Z are independently selected from the group consisting of hydrogen, halogen, C_{1-10} alkyl, C_6 or $_{10}$ aryl, C_{1-10} alkoxy, C_6 or $_{10}$ aryloxy; and

(b) warming the solution sufficiently to rearrange the reaction product of step (a) to the corresponding 4-acyloxy azetidin-2-one.

4,940,521

PROCESS AND APPARATUS FOR PRETREATING THE SURFACE OF A SINGLE-LAYER OR MULTILAYER MOLDED MATERIAL BY MEANS OF AN ELECTRICAL CORONA DISCHARGE

Peter Dinter, Oestrich-Winkel; Hermann Dallmann, Wiesbaden; Lothar Bothe, Mainz, and John D. Gribbin, Schlangenbad, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Aug. 8, 1989, Ser. No. 391,064

Claims priority, application Fed. Rep. of Germany, Aug. 16, 1988, 3827629

Int. Cl.[5] B05D *3/14*

U.S. Cl. 204—164 **23 Claims**

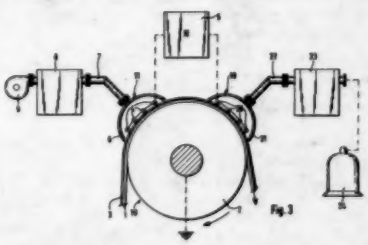


Fig. 3

1. A process for pretreating the surface of a single-layer or multilayer molded material by means of an electrical corona

discharge treatment taking place in the space between high voltage discharge electrodes and a grounded counter-electrode space therefrom, said space between said high voltage electrodes and said ground counter-electrode forming a corona discharge zone, where said single-layer or multilayer molded material is located, said process comprising: locating at least a portion of one surface of said molded material within said corona discharge zone; corona treating said molded material in said corona discharge zone; and at the same time introducing, by means of an air or gas stream, an aerosol into the corona discharge zone, said aerosol being formed by atomizing a liquid.

12. Apparatus for pretreating the surface of a molded material, comprising: a first electrostatic corona discharge means having first high voltage electrodes and a grounded counter-electrode having a metallic surface, said first high voltage electrodes being covered with dielectric material and arranged a distance away from said counter-electrode; a high-frequency, high voltage generator connected with said first high voltage electrodes; a first housing for shielding said first high voltage electrodes from the environment; an atomizer for atomizing liquid to yield a suspendible aerosol; a first line connected to said first housing on one end and to said atomizer on the other end; and a blower whose throughput can be regulated and which is connected to the atomizer which conveys the carrier gas for the aerosol through the atomizer into said first housing via said first line.

4,940,522

METHOD FOR MANUFACTURING PLATED STEEL SHEET FOR CANS

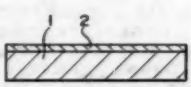
Hiroshi Kagechika; Tadahiko Mishima; Yoshinori Yomura; Hiroshi Ishikawa; Naoyuki Oniwa, and Yoshihiko Yasue, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Division of Ser. No. 281,032, Dec. 7, 1988, Pat. No. 4,897,316. This application Sep. 8, 1989, Ser. No. 404,841

Claims priority, application Japan, Dec. 29, 1987, 62-336859

Int. Cl.[5] C23C *14/02, 14/24, 14/34*

U.S. Cl. 204—192.1 **5 Claims**



1. A method of manufacturing a plated steel sheet for cans, comprising the steps of:

preparing a steel sheet having a bare surface which has an average central surface roughness of not more than 0.10 μm; and

performing vacuum deposition directly on the bare surface of said steel sheet to form a plating layer of metal or metal alloy and having a thickness of from 0.01 to 5 μm directly on the surface of said steel sheet, said plating layer having a high image clarity.

4,940,523

PROCESS AND APPARATUS FOR COATING FINE POWDERS

Eiki Takeshima, Chiba, Japan, assignor to Nisshin Steel Company Ltd., Tokyo, Japan

Filed May 31, 1989, Ser. No. 359,116

Claims priority, application Japan, Jun. 9, 1988, 63-140636; Mar. 27, 1989, 1-74770

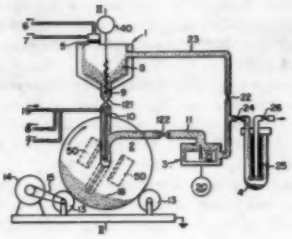
Int. Cl.[5] C23C *14/34*

U.S. Cl. 204—192.12 **11 Claims**

1. A process for coating fine powder of a metal, a ceramic, a plastic or an organic pigment with a metal or a ceramic comprising:

(a) dispersing particles of said fine powder into primary particles by fluid jet mill treatment in an inert atmosphere;

(b) heating the dispersed fine powder in a heating zone of an inert atmosphere under reduced pressure;



(c) placing the heated powder in a rotary barrel sputtering chamber, forming a fluidized bed by rotating the barrel at a low speed, and coating said fluidized powder by sputtering as the barrel is being rotated.

4,940,524

ELECTROACTIVATED CATHODE MATERIALS

Jean-Maurice Perineau, Villiers Sur Marne, and Jean Bachot, Bourg La Reine, both of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

Filed Jun. 20, 1988, Ser. No. 208,503

Claims priority, application France, Jun. 19, 1987, 87 08842

Int. Cl.[5] C25B *11/04*

U.S. Cl. 204—242 **22 Claims**

1. An electroactivated shaped article, which comprises a mass of fibrous material consolidated in a matrix of fluoropolymer binder, at least a portion of the fibers comprising said fibrous material being electrically conductive, said shaped article having a resistivity of less than 0.4 ohm cm and having at least one electrocatalytically active agent uniformly distributed therethrough, and said electrocatalytically active agent comprising at least one Raney metal, or Raney alloy depleted in fugitive metal values.

4,940,525

LOW EQUIVALENT WEIGHT SULFONIC FLUOROPOLYMERS

Bobby R. Ezzell, Lake Jackson, and William P. Carl, Angleton, both of Tex., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 8, 1987, Ser. No. 47,814

Int. Cl.[5] C25B *13/08*

U.S. Cl. 204—252 **11 Claims**

5. A sulfonic fluoropolymer having a fluoropolymer backbone and having pendant groups attached thereto represented by the general formula:

$$ZSO_2\text{-}(CF_2)_a\text{-}(CFR_f)_b\text{-}O\text{-}$$

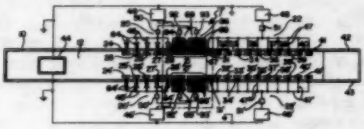
where Z is a halogen, an alkali metal, hydrogen, or OR; R is a branched or linear alkyl radical having from 1 to about 10 carbon atoms or an aryl radical; a is 0–2; b is 0–2; provided a+b is equal to 1 or 2; R_f is selected from the group consisting of —F,—Cl, perfluoroalkyl radicals having from 1 to about 10 carbon atoms and fluorochloroalkyl radicals having from 1 to about 10 carbon atoms, wherein the sulfonic fluoropolymer has an equivalent weight less than about 725.

4,940,526

ELECTROPHORETIC PAINTING APPARATUS

Stephen P. O'Neill, Drayton Plains, Mich., assignor to General Motors Corporation, Detroit, Mich.

Filed Nov. 13, 1989, Ser. No. 434,738
Int. Cl.[5] C25D *13/00, 13/06, 13/12*
U.S. Cl. 204—300 EC 11 Claims



1. An apparatus for electrophoretically depositing paint onto the surface of a substrate upon the application of a direct current thereto as said substrate is conveyed along the length of said apparatus comprising:

an elongated tank for containing a bath of said paint, said tank having an introductory region for admitting said substrate and an exit region for discharging said substrate, said tank being in part defined by two opposing longitudinal sides;

a coating region situated between said introductory and exit regions, said coating region comprising:

at least two primary electrode banks aligned in a first direction of said conveyance and operating at different electrical potentials, said banks each comprising two opposing arrays of electrodes aligned along said sides, said arrays comprising at least one electrode for immersion in said bath, each said electrode having a width extending in said first direction, a length extending in a second direction perpendicular to said first direction, and a frontal surface area equal to the product of said width and said length, wherein each higher potential array is separated from an adjacent lower potential array by a gap greater than said width and sufficient to substantially preclude flow of paint-depositing current therebetween through said bath, and

a plurality of spaced-apart auxiliary electrodes substantially filling each said gap, said auxiliary electrodes each (i) having a second surface area which is no greater than about 25 percent of said frontal surface area, and (ii) being at substantially the same potential as said lower potential bank;

a power source for establishing electrical potentials between said banks and said substrate such that the potential of each successive bank is greater than that of the substrate and the preceding bank in said direction;

electrical conducting means connecting said power source and said electrodes;

first diode means electrically interposed between each electrode of said adjacent lower potential bank and said power source, precluding direct current flow from each such electrode to any other said electrode within the same said array through said conducting means; and

second diode means electrically interposed between each of said auxiliary electrodes and said power source precluding direct current flow between auxiliary electrodes within the same said gap through said conducting means;

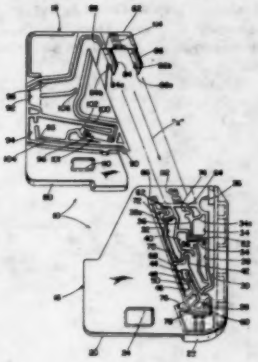
whereby said second diode means, in cooperation with said auxiliary electrodes, allow substantially continuous electrode placement within said coating region while restricting current flow from said higher potential bank to said adjacent lower potential bank to levels below which said paint will deposit on said lower potential bank.

4,940,527

TWO-PART TEST CARTRIDGE FOR CENTRIFUGE

Vidas P. Kazlauskas, Waukegan; Roger A. Janczak, Mundelein, and Benton A. Durley, III, Antioch, all of Ill., assignors to Abbott Laboratories, Abbott Park, Ill.

Continuation-in-part of Ser. No. 196,120, May 25, 1988, which is a continuation-in-part of Ser. No. 56,605, Jun. 1, 1987, abandoned. This application Apr. 12, 1989, Ser. No. 337,011
Int. Cl.[5] G01N *27/403*
U.S. Cl. 204—401 12 Claims



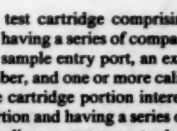
1. A two part test cartridge comprising a first disposable cartridge portion having a series of compartments and passageways including a sample entry port, an exit port, a return port leading to a chamber, and one or more calibrant chambers, and a second reusable cartridge portion interengageable with said first cartridge portion and having a series of compartments and passageways including an entry port adapted to interfit with said exit port of said first cartridge portion and an exit port adapted to interfit with said return port of said first cartridge portion to facilitate fluid flow from said disposable portion into said reusable portion and then back to said disposable portion, said reusable cartridge portion further comprising an ion selective electrode circuit.

4,940,528

OXYGEN SENSOR ELEMENTS

Shuichiro Oki, Aichi, and Fujio Ishiguro, Nagoya, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Jan. 6, 1989, Ser. No. 293,969
Claims priority, application Japan, Jan. 18, 1988, 63-8149
Int. Cl.[5] G01N *27/409*
U.S. Cl. 204—427 9 Claims



1. An oxygen sensor element for measuring oxygen partial pressure in an exhaust gas of an internal combustion engine, said oxygen sensor element comprising: an oxygen ion conductive solid electrolyte body; an electrode layer formed on outer and inner surfaces of said oxygen ion conductive solid electrolyte body; and a protective film formed on the outer electrode layer, at least the outer electrode layer having a thickness of 0.5 to 5.0 μm and consisting essentially of a platinum group metal in which a particulate refractory material is uniformly dispersed simultaneously with the formation of the outer elec-

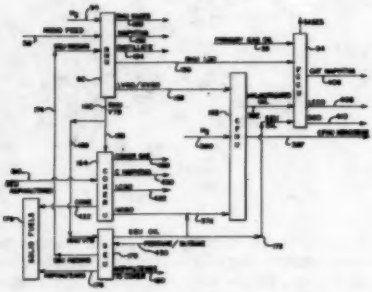
trode layer, the refractory material having a particle diameter in the range of 0.05 to 3.0 μm, wherein the diameter of said refractory material is not greater than 3.0 μm when the thickness of the outer electrode layer is not less than 3.0 μm and the diameter of said refractory material is not more than a thickness of the electrode layer when the thickness of the electrode layer is not greater than 3.0 μm.

4,940,529

CATALYTIC CRACKING WITH DEASPHALTED OIL

William I. Beaton, Wheaton; James L. Taylor, Naperville, both of Ill.; Lawrence B. Peck, Houston, Tex., and James F. Mosby, Burr Ridge, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Jul. 18, 1989, Ser. No. 381,295
Int. Cl.[5] C10G *49/00*
U.S. Cl. 208—61 28 Claims



1. A catalytic cracking process, comprising the steps of:
hydrotreating resid; thereafter deasphalting said hydrotreated resid to produce substantially deasphalted oil;
catalytically cracking said hydrotreated oil in a catalytic cracking unit in the presence of a cracking catalyst to produce upgraded oil leaving coked catalyst; and
regenerating said coked catalyst in the presence of a combustion-supporting gas comprising excess molecular oxygen in an amount greater than the stoichiometric amount required for substantially completely combusting the coke on said catalyst to carbon dioxide.

4,940,530

TWO-STAGE HYDROCARBON CONVERSION PROCESS

Simon G. Kukes, Naperville, Ill.; Albert L. Hensley, Jr., Munster, Ind.; Jeffrey C. Kelterborn, Hinsdale, and James L. Aderhold, Wheaton, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Feb. 21, 1989, Ser. No. 312,205
The portion of the term of this patent subsequent to Mar. 14, 2006, has been disclaimed.
Int. Cl.[5] C10G *65/12*
U.S. Cl. 208—89 15 Claims

1. A multiple stage process for hydroconversion of a hydrocarbon feedstock containing nitrogen- and sulfur-containing compounds which comprises:
(a) contacting said feedstock in a hydrotreating stage comprising a hydrotreating reaction zone wherein hydrogen is contacted with said hydrocarbon feedstock in the presence of a hydrotreating catalyst at hydrotreating conditions wherein a substantial portion of the nitrogen- and sulfur-containing compounds are converted to hydrogen sulfide and ammonia;
(b) passing at least a portion of the effluent from said hydrotreating reaction zone to a stripping zone wherein a substantial portion of the hydrogen sulfide and ammonia is removed from the hydrotreating reaction zone effluent to form a stripping zone effluent;
(c) contacting at least a portion of said stripping zone effluent in a hydrocracking stage wherein said stripping zone effluent is contacted with hydrogen at hydrocracking conversion conditions in the presence of a catalyst comprising a hydrogenation component comprising a nickel component and a tungsten component wherein the nickel component is present in an amount ranging from about 1 to about 10 wt. % and the tungsten component is present in an amount ranging from about 10 to about 30 wt. %, both calculated as oxides and based on the total catalyst weight and a support component consisting essentially of a crystalline molecular sieve component and an alumina component wherein the crystalline molecular sieve component is present in the support in an amount less than about 60 wt. % and greater than about 25 wt. % based on the total weight of the support component.

4,940,531

CATALYTIC CRACKING PROCESS EMPLOYING AN ACID-REACTED METAKAOLIN CATALYST

Roger J. Lussier, Ellicott City, Md., assignor to W. R. Grace & Co.-Conn., New York, N.Y.

Division of Ser. No. 171,496, Mar. 14, 1988, Pat. No. 4,843,052, which is a continuation of Ser. No. 786,711, Oct. 11, 1985, abandoned, which is a continuation of Ser. No. 552,894, Nov. 17, 1983, abandoned, which is a continuation-in-part of Ser. No. 367,648, Apr. 12, 1982, abandoned, and a continuation-in-part of Ser. No. 380,715, May 21, 1982, abandoned. This application Apr. 10, 1989, Ser. No. 335,015
Int. Cl.[5] C10G *11/02, 11/05, 11/18;* B01J *21/16*
U.S. Cl. 208—120 7 Claims

1. A method for cracking hydrocarbons which comprises reacting a hydrocarbon feedstock under catalytic cracking conditions with a catalyst which comprises an acid reacted metakaolin composition having a mole composition of about 0.8 to 1.0 Al_2O_3.2 SiO_2 and characterized by a surface area of above about 150 m^2/g.

4,940,532

CLEANUP OF HYDROCARBON CONVERSION SYSTEM

Roger L. Peer, LaGrange, and Michael B. Russ, Elmhurst, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Sep. 27, 1989, Ser. No. 413,143
Int. Cl.[5] C10G *35/09*
U.S. Cl. 208—138 6 Claims

1. In a process for the catalytic reforming of a substantially contaminant-free second hydrocarbon feed using a second reforming catalyst, in a catalytic-reforming system having equipment contaminated through contact with a contaminant-containing prior feed, the improvement comprising:
(a) contacting the first hydrocarbon feed in the catalytic-reforming system at first reforming conditions with a first reforming catalyst until contaminant removal from the conversion system is substantially completed and the system is contaminant-free; thereafter
(b) replacing the first reforming catalyst in the contaminant-free catalytic-reforming system with a second reforming catalyst; and thereafter
(c) contacting the second hydrocarbon feed in the contaminant-free catalytic-reforming system with the second reforming catalyst at second reforming conditions.

4,940,533

HYDROPROCESSING HYDROCARBON OILS

Howard D. Simpson, Irvine, and Pauline B. Borgess, Diamond Bar, both of Calif., assignors to Union Oil Company of California, Los Angeles, Calif.

Division of Ser. No. 192,379, May 10, 1988, Pat. No. 4,879,265, which is a continuation-in-part of Ser. No. 825,058, Jan. 31, 1986, Pat. No. 4,743,359, which is a division of Ser. No. 595,260, Mar. 30, 1984, Pat. No. 4,568,450, which is a division of Ser. No. 409,583, Aug. 19, 1982, Pat. No. 4,455,390. This application Sep. 29, 1989, Ser. No. 414,929

Int. Cl.[5] C10G *45/08*

U.S. Cl. 208—216 R 38 Claims

1. A catalytic hydroprocess of a hydrocarbon oil containing nitrogen or sulfur, said hydroprocess comprising contacting a catalytic composition with said hydrocarbon oil under hydroprocessing conditions so as to produce a product hydrocarbon oil containing less nitrogen or sulfur than said hydrocarbon oil, said catalytic composition prepared by the method comprising the steps of (1) impregnating porous refractory support particles with an aqueous impregnating solution comprising (a) one or more Group VIB metal components, (b) one or more phosphorus components and (c) citric acid, said citric acid in a mole ratio to said Group VIB metal components calculated as the Group VIB metal trioxide of less than 1 to 1, said solution having a pH less than 1.0 and (2) calcining the impregnated support particles to produce a catalytic composition containing a Group VIB metal component and a phosphorus component on said porous refractory oxide support.

4,940,534

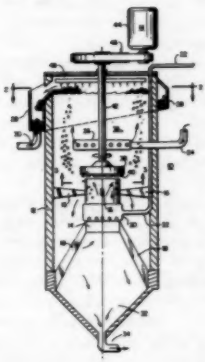
FROTH FLOTATION COLUMN

John M. M. Harrison, Macon, Ga., assignor to J. M. Huber Corporation, Borger, Tex.

Filed Jul. 20, 1989, Ser. No. 382,302

Int. Cl.[5] B03D *1/16, 1/22, 1/24*

U.S. Cl. 209—169 6 Claims



1. A flotation apparatus for separating particles by flotation out of a slurry comprising a column having an inlet for adding slurry into the column, and a froth launder at an upper end of the column for removing froth containing said fine particles, and an outlet at a lower end of the column for removing tailings from said column, a draft tube vertically oriented within the column and having upper and lower open ends, sparger means for injecting air into the slurry in the tube between the lower and upper ends of the draft tube, means for supplying air to the sparger means, and a rotary impeller immediately above the top end of the draft tube, said impeller including a rotary plate having a vertical rotational axis and means for rotating the same in said slurry to produce fine bubbles and permitting quiescent zones in the slurry above and below the position of the impeller.

4,940,535

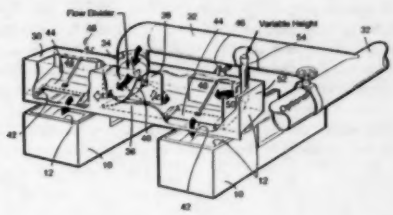
SOLIDS FLOW DISTRIBUTION APPARATUS

William F. Fisher, Horning Norwich, England, and Grant A. Young, Tulsa, Okla., assignors to Amoco Corporation, Chicago, Ill.

Filed Nov. 28, 1988, Ser. No. 276,971

Int. Cl.[5] B07B *1/28;* B65G *53/40*

U.S. Cl. 209—250 9 Claims



1. A feeder device for a plurality of solids separation devices, comprising:

a plenum disposed adjacent the solid separation devices, and including a flow inlet in communication with a source of flow of solids and liquid, and including lower outlets positioned adjacent inlet zones of each solid separation device;

sliding plate valve means for regulating the quantity of solids and liquids that flow from the lower outlets into the inlet zones of each solid separation device; and

variable distribution means connected within the plenum adjacent the flow inlet for regulating the proportion of solids directed towards each solids separation device.

4,940,536

APPARATUS FOR INSPECTING AND SORTING ARTICLES

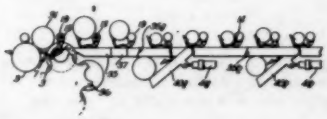
Simon Cowlin, Kelsale; Leslie J. Clark, Colchester; Timothy J. Dennis, Colchester, and Charith A. Gunawardena, Colchester, all of United Kingdom, assignors to Lockwood Graders (U.K.) Limited, United Kingdom

Filed Nov. 12, 1987, Ser. No. 119,380

Claims priority, application United Kingdom, Nov. 12, 1986, 8626991; Nov. 12, 1986, 8626992; Dec. 3, 1986, 8628931

Int. Cl.[5] B07C *5/16*

U.S. Cl. 209—592 15 Claims



1. Apparatus for sorting articles, which apparatus comprises a first endless conveyor comprising a plurality of rollers arranged with their axes transverse to the direction of motion of the first conveyor, said first conveyor being arranged to carry articles to be sorted.

means for causing the first conveyor to move through an inspection region,

means for inspecting articles on the conveyor in the inspection region,

means for causing rotation of the rollers in the inspection region, thereby to cause rotation of the articles in the inspection region,

means for conveying said articles to a sorting zone provided

with at least one bank of actuators for depositing respective ones of the articles,

means responsive to said inspecting means for controlling said actuators,

a second endless conveyor, having a plurality of carriers for the articles, the carriers being pivotally mounted for movement with the second conveyor, on pivot axes transverse to the direction of motion of the second conveyor, a plurality of the said carriers being provided on each said pivot axis, and the pivot axes of the carriers being spaced apart, and means for causing part of the second conveyor to move together with the first conveyor such that a coaxially pivoted plurality of said carriers are located between a respective pair of rollers of said first conveyor.

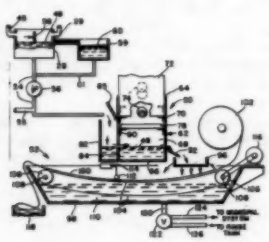
wherein the path of the first and second conveyors is such as to cause the carriers to lift the articles from between the respective pair of rollers, and for the second conveyor alone to convey the said articles to said sorting zone, and wherein actuation of said actuators moves respective ones of said carriers to deposit the articles carried therein.

4,940,537

WATER PURIFICATION SYSTEM

Charles M. Muisener, Newington, Conn., assignor to Loctite Corporation, Newington, Conn.

Filed Jan. 11, 1988, Ser. No. 142,738
Int. Cl.[5] C02F 1/32, 1/52
U.S. Cl. 210—96.1 26 Claims



1. Apparatus for purifying, in a continuous operation, rinse water containing a monomer emulsion of the anaerobic or heat cure variety plus a photoinitiator to cause the generation of radicals to initiate polymerization upon exposure to UV energy comprising:

curing means proximate to but spaced from the rinse water for exposing the rinse water containing the monomer emulsion to UV energy to cause the emulsion to polymerize;

delivery means for directing uninterrupted flow of the rinse water containing the emulsion past and proximate to said curing means at a rate sufficient to substantially complete polymerization of the emulsion in the rinse water; and

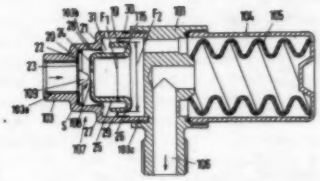
filter means positioned downstream of said curing means to receive from said curing means the irradiated rinse water containing the polymer, said filter means operable for removing the polymer from the rinse water.

4,940,538

APPARATUS FOR DECALCIFING WATER BY PRODUCING TURBULENCE

Erik Kyster, Sonderborg; Niels-Henrik G. Jakobsen; Jens J. Molbaek, both of Nordborg; Ole Stenderup, Sonderborg, and Bjarne Straede, Sonderborg, all of Denmark, assignors to Danfoss A/S, Nordborg, Denmark

Filed Feb. 21, 1989, Ser. No. 312,679
Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807876
Int. Cl.[5] C02F 5/02
U.S. Cl. 210—137 10 Claims



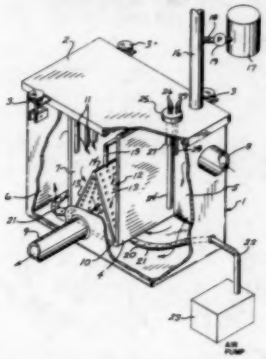
8. Apparatus for decalcifing water by producing turbulence, comprising an annular throttle point member having a water flow passage extending therethrough and has an inlet end, the throttle point member having wall means defining a first bore portion and a second bore portion downstream of the first bore portion that forms at least part of the water flow passage, the first bore portion opening to the second bore portion, and first means mounted by said member to extend within said passage to at least in part extend adjacent to the opening of the first bore portion to the second bore portion for creating turbulent flow that causes cavitation downstream thereof independent of the quantity of water flow, said first means including second means movable in an opening direction by the force of the quantity of water flow from the inlet end and subject to a counterforce for varying the effective area of the opening of the first bore portion to the second bore portion, said throttle point member and first means cooperatively forming a variable throttle point, the throttle point member having a third bore portion that opens to the second bore portion, is of a larger diameter than the second bore portion and is axially opposite the second bore portion from the first bore portion, the second means including a generally cup shaped member having a base plate axially adjacent to the first means, the base plate having an aperture extending axially therethrough and opening to the first means, a rim portion of a larger diameter than the base plate, located in the third bore portion and located downstream of the base plate from the first means and a cylindrical portion extending axially between the base plate and the rim portion, the cylindrical portion having a radial inner surface, a galvanically soluble metal coating on the radial inner surface, a first diaphragm connected to the cylindrical portion, the wall means defining the third bore portion, and a second diaphragm downstream of the first diaphragm and connected to the cup shaped member and to the wall means defining the third bore portion, the diaphragms, the wall means and the cup shaped member defining a pressure relief chamber and the first means having a closure portion that converges toward the base plate aperture for closing the aperture, the cup shaped member being movable under water pressure away from the closure portion to permit water flow from the inlet end, through the first means and through the base plate aperture into the cup shaped member, and thence downstream thereof.

4,940,539

GREASE TRAP CONSTRUCTION

Myer M. Weber, Milwaukee, Wis., assignor to Semco Laboratories, Inc., Milwaukee, Wis.

Filed May 8, 1989, Ser. No. 348,868
Int. Cl.[5] C02F 3/02; E03F 5/16
U.S. Cl. 210—149 15 Claims



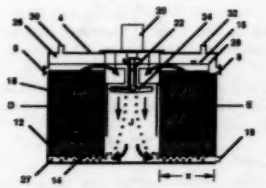
1. A grease trap construction, comprising a housing having an inlet to receive waste water containing grease and foreign material and having an outlet, a screen disposed in said housing between said inlet and said outlet in the flow path of said waste water, said screen being constructed and arranged to collect said grease and foreign material, air supply means for introducing air into the housing into contact with said waste water, heating means disposed in the housing for heating said waste water, temperature control means for operating said heating means and maintaining the temperature of the waste water within predetermined limits, an aqueous composition containing a mixture of enzymes and aerobic bacterial spores, and liquid supply means for supplying said composition into contact with said waste water in the housing.

4,940,540

SUBMERGED BIOLOGICAL WASTEWATER TREATMENT SYSTEM

Curtis S. McDowell, Allentown, Pa., assignor to Tri-Bio, Inc., Allentown, Pa.

Division of Ser. No. 70,899, Jul. 8, 1987, Pat. No. 4,818,404.
This application Jan. 23, 1989, Ser. No. 298,937
Int. Cl.[5] C02F 3/06
U.S. Cl. 210—150 5 Claims



1. In an apparatus for treating an aqueous liquor containing biodegradable waste chemicals in a vessel having an inlet and outlet said biological digestion being accomplished by contacting the liquor with microorganisms growing in slimes on submerged surfaces of a packing material contained in said vessel through which water and gases move freely; the improvement which comprises:

a sealed vessel having at least first vertically-extending chambers within the vessel, these first chambers forming an annulus around a second centrally-located vertically-extending chamber, said first chamber(s) being in fluid communication with each other only at the top and bottom ends and said second chamber being in fluid communication with said first chamber(s) only at the top and bottom ends; and the space between the sealed vessel and top of the chambers defining a top freeboard chamber above the first and second chambers and the space above the sealed vessel and the bottom of the chambers defining a bottom freeboard chamber below the first and second chambers;

each first vertically extending chamber having a porous matrix within having a large surface area suitable for attachment of microorganisms within the confines of said first annular vertically-extending chamber(s),

pumping means placed in said second centrally located chamber for effecting downward flow in the centrally located chamber and upwardly through said first annular vertically-extending chambers and the packing material; and

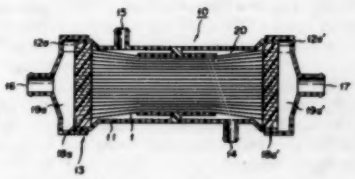
means for introducing gases to the central chamber for downward flow in said second central chamber.

4,940,541

BLOOD CLEANING HOLLOW FIBER MEMBRANE, METHOD FOR CLEANING BLOOD, AND APPARATUS THEREFOR

Juuro Aoyagi, Tokyo, Japan, assignor to Tokyo Bi-Tech Laboratories, Inc., Tokyo, Japan

Filed Nov. 1, 1988, Ser. No. 265,822
Claims priority, application Japan, Feb. 11, 1987, 62-275749; Apr. 11, 1987, 62-277486; Apr. 11, 1987, 62-277487
Int. Cl.[5] B01D 63/02, 63/04, 65/02, 69/08
U.S. Cl. 210—321.8 6 Claims



1. A method of making a blood cleaning apparatus comprising: arranging inside a housing a multiplicity of blood cleaning hollow fiber membranes each comprising a hydrophobic porous hollow fiber membrane, causing the empty spaces inside said hollow fiber membranes to communicate with a blood inlet and a blood outlet disposed in said housing, causing the empty spaces defined by the inner surfaces of said housing and the outer surface of said porous hollow fiber membranes to communicate with a cleaning liquid inlet and a cleaning liquid outlet disposed in said housing, filling the inner empty space of the hydrophobic porous hollow fiber membranes with a hydrophilic compound, and concurrently sterilizing the apparatus and forming a hydrophilic thin layer at least on the inner surface of said hollow fiber membrane by the grafting of the hydrophilic compound through the agency of gamma rays.

4,940,542

LIQUID PURIFYING DEVICE

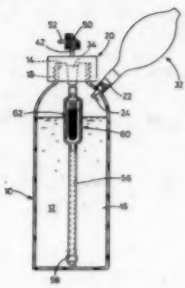
Kazuo Simizu, Nagoya; Shin Sakai, Aichi; Satoru Matsumoto, Nagoya; Osamu Yamamoto, Ichikawa, and Hisao Tanaka, Nagoya, all of Japan, assignors to Tomei Sangyo Kabushiki Kaisha, Nagoya and Mitsubishi Rayon Co., Ltd., Tokyo, both of, Japan

Continuation of Ser. No. 340,037, Apr. 18, 1989, abandoned. This application Oct. 27, 1989, Ser. No. 428,004

Claims priority, application Japan, Apr. 21, 1988, 63-98924; Mar. 31, 1989, 64-183003

Int. Cl.[5] E01D *61/00*

U.S. Cl. 210—321.8 16 Claims



1. A liquid purifying device for dispensing a liquid, comprising:

a container having an enclosed interior space in which a mass of said liquid is stored;

first valve means, attached to said container, for permitting a supply flow of a pressurized gas therethrough into said interior space of the container to raise a pressure within said interior space, and for inhibiting a discharge flow of said pressurized gas and said liquid therethrough out of said interior space;

a liquid delivery path having one end submerged in said mass of the liquid and extending through said container such that the other end is disposed outside said interior space, said liquid being delivered out of said interior space through said liquid delivery path, due to the pressure within said interior space which is raised by said pressurized fluid;

second valve means, disposed in said liquid delivery path, for selectively closing and opening the liquid delivery path to prevent contamination by microorganisms of liquid which has been purified but not yet delivered; and

means for filtering said liquid to remove microorganisms from the liquid delivered through said other end of said liquid delivery path consisting essentially of a micro-porous membrane disposed in a portion of said liquid delivery path which is upstream of said second valve means, as viewed in a direction in which said liquid is delivered out of said interior space, said micro-porous membrane filtering said liquid to remove microorganisms from the liquid delivered through said other end of said liquid delivery path.

4,940,543

PLASMA COLLECTION SET

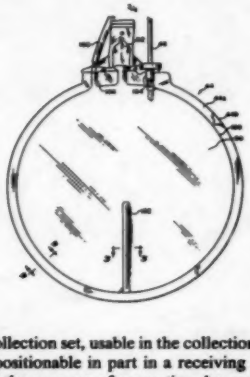
Richard I. Brown, Northbrook; David E. Cerny, Crystal Lake; John T. Foley, Wheeling, and Joseph C. West, Jr., Fox Lake, all of Ill., assignors to Baxter International Inc., Deerfield, Ill.

Continuation of Ser. No. 8,718, Jan. 30, 1987, Pat. No. 4,806,252. This application Nov. 30, 1988, Ser. No. 277,890

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] B01D *21/26*

U.S. Cl. 210—369 16 Claims



1. A fluid collection set, usable in the collection of a quantity of fluid, and positionable in part in a receiving chamber of a centrifuge for the purpose of separating, by centrifugation, a selected fluid component, the set comprising:

a flexible, disk-shaped collection container defining an interior collection volume in which a quantity of fluid can be collected with said collection container having a circular, sealed periphery, and a generally radial container wall heat seal line extending from said periphery toward a center thereof, thereby blocking circumferential fluid flow along said periphery;

a fluid flow contact with a proximal end and a distal end, said proximal end in fluid flow communication with said interior collection volume;

a separated component container in fluid flow communication with said distal end of said conduit with said disk-shaped collection container rotatable in the receiving chamber while simultaneously coupled to said component container so as to accumulate the component separated from the quantity of fluid rotated in the receiving chamber.

4,940,544

DECENTRAL WASTEWATER TREATMENT PROCESS

Peter Gode, Langenfeld; Jens P. Riebe, and Lutz Jeromin, both of Hilden, all of Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Dusseldorf, Fed. Rep. of Germany

Filed Jul. 14, 1988, Ser. No. 219,424

Claims priority, application Fed. Rep. of Germany, Jul. 17, 1987, 3723718

Int. Cl.[5] C02F *3/30*

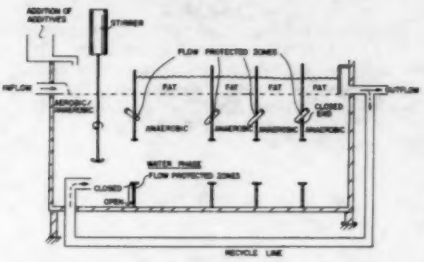
U.S. Cl. 210—603 22 Claims

1. A process for the continuous flow decentral treatment of wastewaters polluted with one or more fats, proteins, or carbohydrates comprising the steps of

A. containing the polluted wastewater in a region containing at least one flow-protected zone, which is a packed or sponge filled blind end tube which acts as a microorganism reservoir, with both aerobic and anaerobic microorganisms for a time sufficient to at least partially degrade the pollutants in the wastewater to fermentation products;

B. contacting the wastewater containing the fermentation

products in a region containing at least one flow-protected zone, which is a packed or sponge filled blind end tube which acts as a microorganism reservoir, with anaerobic microorganisms for a time sufficient to convert most of the fermentation products and any remaining pollutants into digester gas and biomass; and



C. separating the digester gas and biomass from the wastewater;

wherein when conditions are such in the operation of the process that microorganisms in step A or B or both are destroyed in the non-flow-protected zones of said regions, repopulating the wastewater in step A or B or both the microorganisms present in the blind end tubes.

4,940,545

AEROBIC WASTE SLUDGE DIGESTER-THICKENER ORBITAL SYSTEM AND METHOD

David DiGregorio; Richard J. Eismin, both of Salt Lake City, and Frederick M. Riser, Sandy, all of Utah, assignors to Baker Hughes, Inc., Houston, Tex.

Filed Mar. 29, 1989, Ser. No. 330,017
Int. Cl.[5] C02F 3/14
U.S. Cl. 210—609 18 Claims

1. In combination, an orbital ditch comprising an orbital aerobic digestion section formed by a pair of uncovered parallel flow channels bounded by a pair of liquid-confining walls, and an upstanding elongated center partition between and spaced from said walls;

a ditch bottom; and

ditch endwalls spaced from end sections of said partition to form with said channels a closed loop liquid-solids flow path;

means in said closed loop flow path for aerating and transporting a waste activated sludge liquid-solids mixture around said closed loop flow path; and

a cylindrical thickener section within the confines of said flow path, said thickener section including:

a sidewall formed by one of said ditch endwalls;

a thickener section bottom extending to a plane below said ditch bottom; and

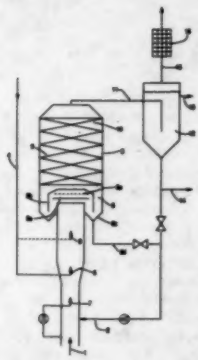
a rotatable thickener rake having blades positioned in said thickener section above said thickener section bottom and below said ditch bottom for transporting sludge settling in said thickener section to a sludge outlet in said thickener section bottom.

4,940,546

INSTALLATION FOR AEROBIC BIOLOGICAL PURIFICATION OF POLLUTANT-CONTAINING WATER

Alfons Vogelpohl, Clausthal-Zellerfeld, and Norbert Rabiger, Meisenweg, both of Fed. Rep. of Germany, assignors to TECON GmbH, Clausthal-Zellerfeld, Fed. Rep. of Germany

Filed Feb. 23, 1989, Ser. No. 313,850
Int. Cl.[5] C02F 3/06, 3/22
U.S. Cl. 210—613 15 Claims



1. A process for aerobic biological purification of pollutant-containing water in an apparatus consisting of an axial-flow submerged reactor and a sedimentation tank connected downstream therefrom for separation of biosludge from purified water, wherein said reactor is a pipe containing a two-stage activated-sludge chamber, said pipe comprising:

(a) a first activated-sludge stage in which a driving-jet nozzle is disposed upstream from said stage for the dispersion of air and microorganisms in waste water to be purified; and

(b) a second activated-sludge stage in which internals are disposed for homogeneous dispersion of gas bubbles and microorganisms, as well as for immobilization of said microorganisms wherein said process comprises the steps of:

(i) waste water to be purified is fed through a supply line to the reactor;

(ii) microorganisms and supply air are dispersed in the waste water in the first activated-sludge stage by means of a driving-jet nozzle disposed upstream of the first stage;

(iii) the air-waste water-microorganisms mixture flows through the first activated-sludge stage and is deflected by a deflector plate into a degassing pipe, such that said mixture is degassed by means of opening into the second activated-sludge stage through which gas can pass, and said degassed mixture is passed into an intermediate sedimentation tank for separation of a sedimented mass;

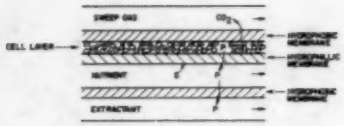
(iv) the air-waste water-microorganisms mixture is subjected to a posttreatment in the second stage, such that air bubbles, microorganisms and water are homogeneously dispersed by the internals, and

(v) the mixture flows through a connecting pipe into a sedimentation tank, wherein the separation of the microorganisms from the purified water takes place and outgassing is accomplished through an exhaust-air line.

4,940,547
USE OF INHIBITORY SOLVENTS IN MULTI-MEMBRANE BIOREACTOR

Toohyon Cho, and Michael L. Shuler, both of Ithaca, N.Y., assignors to Cornell Research Foundation, Inc., Ithaca, N.Y.

Filed Jul. 7, 1986, Ser. No. 882,803
Int. Cl.[5] B01D *13/00*
U.S. Cl. 210—643 **5 Claims**



1. A method of separating biological product from the cell layer of a membrane-moderated biological reaction using an organic solvent which is normally toxic toward the biological reaction when in contact with product producing cells in the cell layer which method comprises:

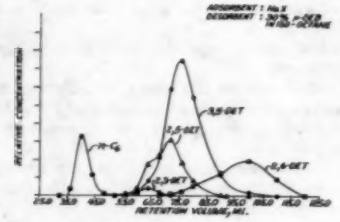
separating said product from the cell layer by means of hydrophobic immobilized liquid membrane which contains said toxic organic solvent and which is adapted to absorb said product thereby recovering said product and preventing said product from accumulating to high concentrations in the cell layer while preventing the toxic solvent from adversely affecting the rate and extent of the biological reaction,

said toxic solvent-containing hydrophobic immobilized membrane having a critical aqueous phase entry pressure higher than the pressure employed in the biological reaction to feed aqueous nutrients to said cell layer, and said pressure employed to feed aqueous nutrients to the cell layer being higher than the pressure on the solvent side of the immobilized membrane.

4,940,548
CHROMATOGRAPHIC SEPARATION PROCESS FOR RECOVERING INDIVIDUAL DIETHYLTOLUENE ISOMERS

Hermann A. Zinnen, Evanston, Ill., assignor to UOP, Des Plaines, Ill.

Filed Apr. 17, 1989, Ser. No. 339,536
Int. Cl.[5] B01D *15/08*
U.S. Cl. 210—656 **28 Claims**

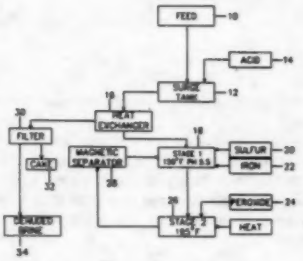


1. A process for separating isomers of diethyltoluene from a feed mixture thereof, said feed mixture comprising at least one isomer from the group 2,6-diethyltoluene and 3,5-diethyltoluene and at least one other isomer of diethyltoluene said process comprising contacting said feed mixture at adsorption conditions with an adsorbent selected from the group consisting of X type zeolites, cation exchanged with barium and potassium cations or a sodium, lithium, or copper cation or mixtures thereof and Y type zeolites cation exchanged with barium, calcium, sodium, potassium or copper cations or mixtures thereof, thereby selectively adsorbing one of said isomers, removing at least one relatively non-adsorbed isomer from contact with said adsorbent and recovering said adsorbed isomer by desorption, at desorption conditions, with a desorbent material comprising monocyclic alkyl substituted aromatics.

4,940,549
METHOD FOR REMOVING TOXIC METALS FROM AGRICULTURAL DRAIN WATER

Orrie C. Olsen, and Peter F. Santina, both of Walnut Creek, Calif., assignors to Santina Water Company, Concord, Calif.

Filed Jan. 31, 1989, Ser. No. 304,497
Int. Cl.[5] C02F *1/48, 1/70*
U.S. Cl. 210—695 **18 Claims**



1. A method for removing soluble selenium from a solution of agricultural tile drain water, or irrigation effluent, comprising,

adjusting the pH of the solution to a range of about 3.0 to 6.0,

adding a reducing agent to the solution, with agitation, and forming a slurry with the solution and reducing agent,

adding wettable elemental sulfur to the solution,

the amounts of the reducing agent and of the sulfur being selected in combination to permit recovery of the selenium with additional steps of:

continuing to agitate the slurry,

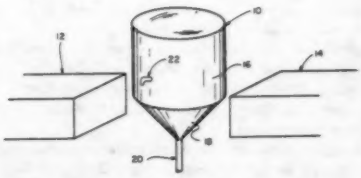
after a period of time within which the pH of the slurry rises and then stabilizes, oxidizing the slurry sufficiently to effect selenium recovery as a precipitate, and continuing to agitate the slurry substantially continuously, and

separating the recovered, precipitated selenium.

4,940,550
MULTI-STEP PROCESS FOR CONCENTRATING MAGNETIC PARTICLES IN WASTE SLUDGES

John L. Watson, Rolla, Mo., assignor to The Curators of the University of Missouri, Columbia, Mo.

Filed May 2, 1989, Ser. No. 346,554
Int. Cl.[5] B01D *35/06*
U.S. Cl. 210—695 **12 Claims**



7. A method of increasing the solids content of a sludge

which contains magnetizable suspended solids, comprising the following steps:

a. mixing a chemical flocculating agent with the sludge;

b. allowing particles in the sludge to form aggregated magnetic particles under non-turbulent conditions within a treatment tank positioned in a magnetic field;

c. subjecting the sludge to the magnetic field which will pull the aggregated magnetic particles in a selected direction, causing them to form a compacted sludge;

d. filtering the sludge through a filter layer placed inside the tank to convert the compacted sludge into a dewatered cake.

4,940,551

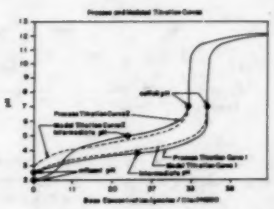
METHOD FOR PH CONTROL

James B. Riggs, 2609 24th St., Lubbock, Tex. 79410, and R. Russell Rhinehart, 3920 96th St., Lubbock, Tex. 79423

Filed May 19, 1989, Ser. No. 354,344

Int. Cl.[5] C02F *1/66*

U.S. Cl. 210—743 **14 Claims**



1. A process for automatically controlling the pH in a process fluid stream by flowing an acid or base reagent stream into the process stream,

a. said process stream having

i. an influent section flowing into

ii. an intermediate section flowing into

iii. an outfall section,

iv. a device to measure the process stream flow rate, and

v. wherein said process comprises the steps of measuring pH in the influent, intermediate, and outfall sections,

b. also

i. injecting a first portion of said reagent stream between said influent and intermediate sections,

ii. injecting a second portion of said reagent stream between said intermediate and outflow sections,

iii. proportioning the reagent stream between the first and second portions

iv. measuring the flow rate of the reagent stream, and

v. controlling the reagent flow rate by estimating a titration curve for the process stream that conforms to the measured pH and injected reagent portions, using said titration curve to estimate the desired reagent flow, and controlling the reagent flow to the estimated desired reagent flow.

4,940,552

PASSIVATION OF POLYAMINE DISPERSANTS TOWARD FLUOROHYDROCARBON COMPOSITIONS

John A. Cengel, Wheaton, and Peter G. Pappas, Downers Grove, both of Ill., assignors to Amoco Corporation, Chicago, Ill.

Continuation-in-part of Ser. No. 246,008, Mar. 20, 1981, abandoned. This application Apr. 30, 1982, Ser. No. 373,683

Int. Cl.[5] C10M *1/36*

U.S. Cl. 252—51.5 A **7 Claims**

1. A composition comprising the reaction product of a Mannich polyamine dispersant with maleic anhydride, said polyamine dispersant containing at least one primary or secondary amine and being effective as a dispersant additive for lubricating oils; and wherein the amount of maleic anhydride is effective to reduce the reactivity of said Mannich polyamine dispersant toward fluorohydrocarbon compositions.

4,940,553

AQUEOUS NICKEL HYDROXIDE PASTE OF HIGH FLOWABILITY

Klaus von Benda, Nurtingen; Gábor Benczúr-Ürmössy, Stuttgart, and Gerhard Berger, Deizisau, all of Fed. Rep. of Germany, assignors to Deutsche Automobilgesellschaft, Fed. Rep. of Germany

Filed May 26, 1989, Ser. No. 357,273

Claims priority, application Fed. Rep. of Germany, May 26, 1988, 3817826

Int. Cl.[5] H01M *4/32*

U.S. Cl. 252—182.1 **11 Claims**

1. Aqueous $Ni(OH)_2$ paste of high flowability for the vibration filling of foam-structure and fiber-structure electrode plaques having a content of nickel hydroxide of about 30 to 50% by volume, a maximum particle size of about 0.04 mm, a plastic viscosity of about 0.1 to 1 Pa.s and a yield value of between about 10 and 120 Pa, and also a pH of between about 9 and 12, which, in addition, also contains a dispersant, wherein the dispersant is selected from one of the group consisting of water-soluble salts of derivatives of di- and polyphosphonic acids and the group consisting of water-soluble salts of polyphosphoric acid, wherein the polyphosphoric acid has about 3 to 20 phosphorus atoms per molecule.

4,940,554

CONDITIONING AGENT FOR THE TREATMENT OF BASE MATERIALS

Hans-Joachim Grapentin; Hubert-Matthias Seidenspinner, and Detlef Tessmann, all of Berlin, Fed. Rep. of Germany, assignors to Schering Aktiengesellschaft, Berlin & Bergkamen, Fed. Rep. of Germany

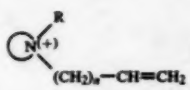
Continuation of Ser. No. 899,922, Aug. 25, 1986, Pat. No. 4,281,990. This application Feb. 5, 1988, Ser. No. 152,539

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1985, 3530617

Int. Cl.[5] C07D *293/12*

U.S. Cl. 252—357 **15 Claims**

1. Conditioning agent for treatment of base materials for subsequent complete and uniform metallization comprising an aqueous solution of a non-ionogenic cleaning agent an active agent selected from the group consisting of quaternary salts of N-alkenyl-substituted cyclical nitrogen compounds of formula (I):



(I)

wherein

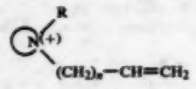
represents a cyclical nitrogen cation,

R is a member selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 4 carbon atoms and hydroxy-substituted alkyl radicals containing from 1 to 4 carbon atoms,

n is a member selected from the group consisting of 0 and 1, and $X^{(-)}$ is a member selected from the group consisting of anions of inorganic acids and anions of organic acids.

15. Conditioning agent for treatment of base materials for subsequent complete and uniform metallization comprising a

nonionogenic cleaning agent; a dicarboxylic acid selected from the group consisting of oxalic acid, malonic acid, succinic acid, glutaric acid, adipic acid and maleic acid; and an aqueous solution of an active agent selected from the group consisting of quaternary salts of N-alkenyl-substituted cyclical nitrogen compounds of formula (I):



(I)

wherein

represents a cyclical nitrogen cation,

R is a member selected from the group consisting of hydrogen, alkyl radicals containing from 1 to 4 carbon atoms and hydroxy-substituted alkyl radicals containing from 1 to 4 carbon atoms,

n is a member selected from the group consisting of 0 and 1, and $X^{(-)}$ is a member selected from the group consisting of anions of inorganic acids and anions of organic acids.

4,940,555

STORAGE-STABLE ANIONIC LIQUID DETERGENT COMPOSITIONS CONTAINING AMPHOTERIC DISTYRYL DERIVATIVE FLUORESCENT WHITENERS

Claude Eckhardt, Riedisheim, France, and Heinz Hefti, Reinach, Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

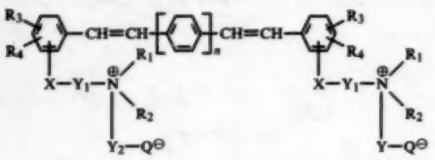
Filed Mar. 15, 1989, Ser. No. 323,707

Claims priority, application Switzerland, Mar. 25, 1988, 1144/88

Int. Cl.[5] C09K *11/06*; C11D *1/02, 3/42, 17/08*

U.S. Cl. 252—543 7 Claims

1. An anionic liquid detergent composition containing 1 to 60% of an anionic surfactant and 0.01 to 2% of a fluoroescent whitening agent consisting of an amphoteric distyryl compound, or a mixture of distyryl compounds, of formula I



(I)

wherein

X is oxygen, sulfur, a direct bond, $—SO_2N(R_5)$, $—CON(R_5)$ or —COO—,

Y_1 and Y_2 are each independently of the other C_1–C_4alkylene or hydroxypropylene,

R_1 and R_2 are each independently of the other C_1–C_4alkyl or $—NR_1R_2$ is a pyrrolidine, piperadine, hexamethylenimine of morpholine ring, and R_1 together with R_3 is also a piperazine ring,

R_3 and R_4 are each independently of the other hydrogen, C_1–C_4alkyl, halogen, C_1–C_4alkoxy, C_3–C_4alkenyl, —CN or, in ortho-position to each other, together are a trimethylene or tetramethylene group,

R_5 is hydrogen, C_1–$_4$alkyl, cyanoethyl or, together with R_1 is a piperazine ring,

Q is —COO or $—SO_3$, and

n is 1 or 2.

4,940,556

METHOD OF PREPARING LONG ACTING FORMULATION

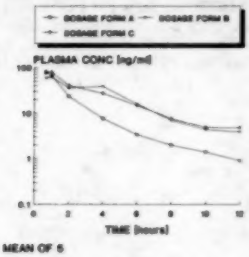
Calum B. MacFarlane, Linlithgow; Alastair B. Selkirk, Edinburgh, and Michael J. Dey, East Calder, all of Scotland, assignors to Syntex (U.S.A.) Inc., Palo Alto, Calif.

Continuation-in-part of Ser. No. 823,896, Jan. 30, 1986, abandoned. This application Jul. 26, 1987, Ser. No. 57,469

Int. Cl.[5] B29B *9/12*

U.S. Cl. 264—15 12 Claims

NICARDIPINE HCl PLASMA LEVELS IN HUMANS



MEAN OF 6

1. A method of preparing spheroids which are suitable for administration to humans and which provide long-acting sustained release of a therapeutically effective amount of dihydropyridine calcium channel blocker, which method consists essentially of;

(a) forming an essentially aqueous wet mass comprising an effective amount of the calcium channel blocker in admixture with a pH-dependent binder which is less soluble at lower pH and more soluble at higher pH, wherein the binder constitutes about 5 to 50 weight percent of each spherical partical;

(b) extruding the wet mass to form rod-shaped, substantially cylindrical segments having diameters in the range of up to 1.2 millimeters;

(c) shaping the rod-shaped segments into spheroids; and

(d) drying the spheroids to obtain spheroids having area radius to circumference radius ratios in the range of 0.85 to 1.0.

4,940,557

METHOD OF MANUFACTURING MOLDING MEMBERS

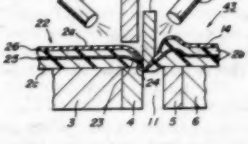
Kaoru Kimura, Yokohama City, Japan, assignor to Hashmoto Forming Industry Co., Ltd., Yokohama City, Japan

Filed Dec. 27, 1988, Ser. No. 289,831

Claims priority, application Japan, Dec. 28, 1987, 62-333344; Dec. 28, 1987, 62-333345; Jan. 29, 1988, 63-19287; Jan. 29, 1988, 63-19288

Int. Cl.[5] B29C *35/12*; B28B *11/16*

U.S. Cl. 264—26 7 Claims



1. A method of manufacturing molding members composed of a thermoplastic synthetic resin material, comprising the

steps of forming said resin material into an elongate shaped body with a profiled cross-section corresponding to that of the molding member, and cutting the shaped body on at least one end into a predetermined length of the molding member;

wherein said shaped body is subjected to such a controlled heating that the shaped body has its interior portion heated above the softening temperature of the resin material whereby its interior portion becomes softer than its outer surface portion; and

wherein a cutter blade is advanced into the shaped body while it is subjected to said controlled heating outer surface portion inwardly, without it being cut or ruptured by the blade, to form a curved end surface of the molding member which is continuous with the remaining outer surface, and subsequently cutting away the outer surface portion;

wherein the cut surface has a minimized surface area, and the outer surface portion substantially covers the interior portion and is arranged on a substantially rear side of the shaped body so as not to be visible from outside when the molding member is mounted in place.

4,940,558

METHOD FOR MOLDING ARTIFICIAL URETHANE ROCK

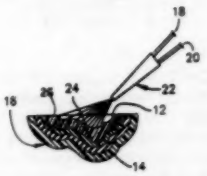
Enos D. Jarboe, University City; Rodney D. Jarboe, Creve Coeur, and Edward M. Barclay, Affton, all of Mo., assignors to Futura Coatings, Inc., St. Louis, Mo.

Continuation-in-part of Ser. No. 128,029, Dec. 3, 1987, Pat. No. 4,847,026. This application Jul. 10, 1989, Ser. No. 377,713

The portion of the term of this patent subsequent to Jul. 11, 2006, has been disclaimed.

Int. Cl.[5] B29C *67/22*

U.S. Cl. 264—46.7 **16 Claims**



1. A method for molding an artificial urethane rock which comprises selecting a rock to be reproduced, creating a flexible rubber mold and supporting cradle having a mold cavity conforming to the exterior of said rock, said mold having a substantial degree of flexibility and being created by applying an uncured liquid rubber forming material to said rock, curing said uncured liquid rubber forming material to produce said rubber mold, said cradle being formed by applying by spraying a low density urethane foam forming mixture to the exterior of the rubber mold to provide a self-supporting cradle, spraying a two sided urethane composition into the mold cavity, said urethane composition comprising an isocyanate side and a polyol side and being mixed in a spray gun in a spray-in-mold process, carrying out said spraying to build up the molded artificial urethane rock to a desired thickness and stripping said cradle and mold from the molded artificial urethane rock after curing.

4,940,559

PROCESS FOR THE PRODUCTION OF UNIFORM POY FILAMENTS

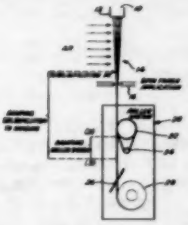
Bernd Kretschmann, Kronberg, and Dietmar Wandel, Hanau, both of Fed. Rep. of Germany, assignors to Davy McKee Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 9, 1988, Ser. No. 281,636

Claims priority, application Fed. Rep. of Germany, Jun. 11, 1988, 3819913

Int. Cl.[5] D01D *5/12*

U.S. Cl. 264—130 **7 Claims**



1. A method for the production of pre-oriented low crystalline, synthetic filaments characterized by a high degree of uniformity and ability to be worked at high speeds in a friction-draw texturing process, comprising:

spinning the filaments from a molten polymer mass;

solidifying and applying a spin finish to said filaments;

passing said filaments along a filament path into a draw-off machine having a system of rollers and a winding unit;

said system of rollers comprising a driven roller and a freely-rotating smaller roller around which rollers the filaments are wrapped more than one time;

the mean filament tension between said rollers and said winding unit being equal to or less than one-half the yield point tension of a stress-strain curve for said filaments;

whereby

the number of wraps is selected to produce a damping ratio of the fluctuation in tension of the filament between the point of solidification and said winding unit of less than 0.10;

said damping ratio being defined as the ratio of the fluctuation range of the filament tension at the beginning and at the end of said filament path.

4,940,560

PROCESS FOR PREPARING ANTISTATIC FIBER

Tatsuhiko Shizuki; Kaoru Ban; Fumikazu Yoshida, and Masakatsu Ohguchi, all of Otsu, Japan, assignors to Toyo Boseki Kabushiki Kaisha, Japan

Continuation of Ser. No. 853,081, Apr. 17, 1986, abandoned, which is a division of Ser. No. 600,054, Apr. 13, 1984, Pat. No. 4,600,743. This application Apr. 25, 1988, Ser. No. 186,664

Claims priority, application Japan, Apr. 14, 1983, 58-666431; May 9, 1983, 59-81516

Int. Cl.[5] D01F *1/09, 11/04*

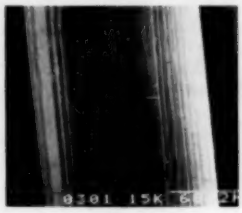
U.S. Cl. 264—211 **7 Claims**

1. A process for preparing an antistatic fiber, comprising the steps of:

providing a spinneret having one or more orifices, each orifice having an opening area of not less than 0.2 mm^2; and

melt spinning a fiber forming thermoplastic polymer containing at least one of polyoxyalkylene glycol and its derivatives as an amount of not less than 0.5% by weight through the spinneret, under the conditions that the opening area (S; mm^2) of each orifice and the throughput (Q; g/mm) per orifice satisfies the following relationship:

$S \geq 0.02Q^2 + 0.2$, and such that the fibers formed have a half-life time of electric charge leakage of not more than



150 seconds before and after treatment with a weight decreasing agent.

4,940,561

METHOD FOR FORMING A POLYMERIC MOLD

Kenneth E. Fritz, 1324 Hybla Rd., Richmond, Va. 23236

Filed Feb. 6, 1989, Ser. No. 306,107
Int. Cl.[5] B29C *41/08*
U.S. Cl. 264—225 **2 Claims**

1. A method for producing a coating useful in forming casting molds comprising the steps of:

agitating a quantity of pre-promoted polyester resin in a container;

admixing into said resin, in the course of said agitation, a quantity of atomized aluminum powder to a weight ratio of 10% to 50% of said resin said atomized aluminum powder admixed in said resin including aluminum powder comprising the ratios of

$$\frac{\text{4 times 200 mesh}}{\text{1 times 400 mesh}} + \frac{\text{2 times 200 mesh}}{\text{1 times 400 mesh}}$$

storing said mixture of said resin and powder for a period of 12 to 24 hours;

introducing a catalyst into said mixture; and

spraying said catalyzed mixture onto an object defining the mold cavity of a casting mold.

4,940,562

FILTER ELEMENT AND METHOD FOR MANUFACTURE THEREOF AND MICRO-FILTRATION FILTER HAVING THE FILTER ELEMENT

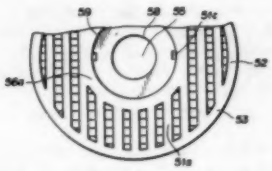
Masaharu Watanabe, and Takashi Mouzen, both of Tokyo, Japan, assignors to Kitz Corporation, Japan

Filed Aug. 5, 1988, Ser. No. 229,336
Int. Cl.[5] B01D *67/00*
U.S. Cl. 264—234 **14 Claims**

1. A method for the manufacture of a filter element comprising the steps of:

(a) providing a plurality of unit members and a plurality of spacers, each of said unit members being composed of fluorine resin or fluorine resin copolymer and comprising a supporting plate having a pair of planar porous membranes joined to the opposite surfaces thereof and having an opening for insertion of a spacer and removal of a cleaned fluid, said opening having an inner peripheral surface and a stepped part formed on the peripheral edge thereof, each of said spacers being composed of fluorine resin or fluorine resin copolymer and having an outer peripheral part and a stepped part formed on the inner peripheral part thereof,

(b) forming a first axial seal part between said stepped part of said opening of one of said unit members and said outer peripheral part of one of said spacers by means of thermal fusion in the axial direction,



(c) forming a second axial seal part between said inner peripheral surface of said opening of another one of said unit members and said stepped part of said one of said spacers by means of thermal fusion in the axial direction, and

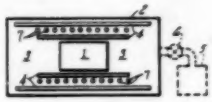
(d) repeating the steps (b) and (c) using other ones of said unit members and spacers to thereby interconnect said unit members and spacers at said first and second axial seal parts to form a filter element.

4,940,563

MOLDING METHOD AND APPARATUS USING A SOLID FLOWABLE, POLYMER MEDIUM

Robert V. Kromrey, Campbell, Calif., assignor to United Technologies Corporation, Hartford, Conn.

Continuation of Ser. No. 829,048, Feb. 13, 1986, abandoned.
This application May 26, 1988, Ser. No. 201,345
Int. Cl.[5] B29C *43/02*
U.S. Cl. 264—257 **39 Claims**



1. The method of forming an article from an article precursor comprising, placing the article precursor within a pressure vessel, substantially filling the vessel with a solid, flowable, polymer medium and causing said medium to produce a substantially uniform, predetermined medium pressure on the surface of said article precursor by applying heat or pressure to the medium, wherein the temperature of the article precursor and pressure to which the article precursor is subjected are independently controlled.

4,940,564

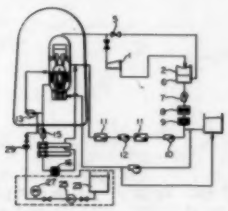
SUPPRESSION OF DEPOSITION OF RADIOACTIVE SUBSTANCES IN BOILING WATER TYPE, NUCLEAR POWER PLANT

Motohiro Aizawa; Katsumi Ohsumi, both of Hitachi; Takashi Honda, Katsuta, and Hisao Itow, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo and Hitachi Engineering Co., Ltd., Ibaraki, both of, Japan

Filed Oct. 20, 1987, Ser. No. 110,454
Claims priority, application Japan, Oct. 20, 1986, 61-249168
Int. Cl.[5] G21C *19/28*
U.S. Cl. 376—306 **6 Claims**

4. A method for suppressing deposition of radioactive substances in a boiling water-type, nuclear power plant, which

comprises injecting an alkaline element into reactor water to adjust the reactor water to a slightly alkaline condition in the presence of an amount of the oxygen formed by radiolysis of the reactor water and dissolved in the reactor water without hydrogen injection during the initial nuclear heatup operation period of the boiling water-type, nuclear power plant after the



construction of the boiling water-type, nuclear power plant and circulating the reactor water containing the injected alkaline element through the primary cooling water system of a nuclear reactor in the boiling water-type, nuclear power plant, thereby forming an oxide film on the surfaces of out-of-core components in the primary cooling water system of the nuclear reactor.

4,940,565

METHOD FOR MANUFACTURING FRICTIONAL LOCKING RINGS FOR STEPPED MOTOR VEHICLE TRANSMISSION SYNCHRONIZING MECHANISMS

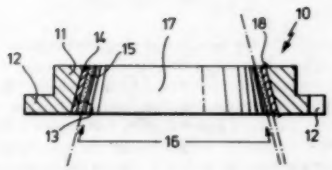
Erich R. Müller, Hohe Strasse 15, D-7110 Öhringen-Cappel, Fed. Rep. of Germany, assignor to Erich R. Mueller

Continuation of Ser. No. 116,453, Nov. 3, 1987, abandoned. This application Jul. 24, 1989, Ser. No. 384,851

Claims priority, application Fed. Rep. of Germany, Nov. 3, 1986, 3637385

Int. Cl.[5] B22F *7/00*

U.S. Cl. 419—8 **9 Claims**



1. A method for manufacturing frictional synchronizing rings for stepped motor vehicle transmissions, comprising the steps of:

manufacturing a ring-shaped metallic base member having a rotational axis and a first conical surface thereabout;

depositing a frictional layer of a predetermined first thickness on said first conical surface, said layer being made of a sintering powder;

sintering said layer on said first conical surface;

providing a tool having a second conical surface complementary to said first conical surface;

applying said tool with said second conical surface on said first conical surface; and

pressing said tool against said base member to calibrate said sintered frictional layer to a predetermined second thickness less than said first thickness.

4,940,566

ALLOY AND METHODS OF USE THEREOF

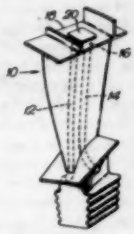
Philip S. Wood, Lancashire, and Peter J. Fell, Yorkshire, both of England, assignors to Rolls-Royce plc, London, England

Filed Jun. 9, 1989, Ser. No. 363,919

Claims priority, application United Kingdom, Jul. 14, 1988, 8816737; Aug. 9, 1988, 8818855

Int. Cl.[5] C22C *19/05*

U.S. Cl. 420—443 **4 Claims**



1. An alloy suitable for use in the repair and/or manufacture of a nickel based superalloy component consisting of by weight percentage,

Al	Co	Cr	Fe	Hf	Ta	Ti	W	B	Y	Ni
2	9	8	—	1.0	1.0	1.25	6	2.8	0.001	Balance
3	11	10	1.8	1.5	1.5	1.75	8	3.4	0.02	

4,940,567

APPARATUS FOR CATALYTICALLY REDUCING NOXIOUS SUBSTANCES IN FLUE GAS

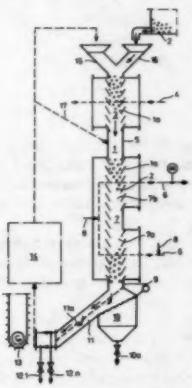
Manfred Ohlmeyer, Eggenstein-Leopoldshafen, and Martin Benzel, Aachen, both of Fed. Rep. of Germany, assignors to Kernforschungszentrum Karlsruhe GmbH, Karlsruhe, Fed. Rep. of Germany

Division of Ser. No. 919,708, Oct. 16, 1986, Pat. No. 4,756,891, and Ser. No. 117,309, Nov. 6, 1987, Pat. No. 4,810,476. This application May 2, 1988, Ser. No. 189,176

Claims priority, application Fed. Rep. of Germany, Oct. 17, 1985, 3536958; Nov. 6, 1986, 3637871

Int. Cl.[5] B01D *53/36*

U.S. Cl. 422—173 **12 Claims**



1. An apparatus for continuously pre-heating combustion air

and catalytically reducing noxious substances in flue gas, comprising

a heat-exchanger housing having a first part and a second part, and gas-permeable interior walls provided to contain and permit the flow of a plurality of separately movable heat-storage elements comprising catalyst-coated heat-storage elements, and a means providing a constrictive passage for the elements, said constrictive means operatively connected to said first part and said second part of said housing, said first part of said housing having an inlet for the elements and an inlet and an outlet for air, and said second part of said housing having an inlet and an outlet for flue gas and an outlet for the elements;

means for removal of said elements from the outlet for the elements and resupply of the elements to the inlet for the elements, the inlet and the outlet for the elements defining a first direction of flow of the elements which is transverse to a second direction of flow of air and flue gas;

means for measuring noxious substance concentrations of the flue gas exiting the top section of the heat exchanger and for causing disposing of heat storage elements having a spent catalyst coating thereon and substituting new heat storage elements therefore when the noxious substance concentrations exceed predetermined allowable noxious substance concentrations; and

discharge means for the elements provided with a means for separating the elements by size, shape or weight, said discharge means being operatively connected to said second part of said housing and to said removal and resupply means at the outlet for the elements.

4,940,568

ARRANGEMENT FOR THE CONTINUOUS MELTING OF GRANULATED SILICON FOR A BAND-DRAWING METHOD

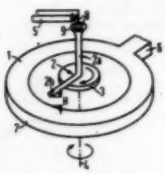
Gerhard Hoyler, Munich; Josef Grabmaier, Berg; Richard Falckenberg, Wald, and Bernhard Freienstein, Munich, all of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Oct. 14, 1988, Ser. No. 257,522

Claims priority, application Fed. Rep. of Germany, Oct. 27, 1987, 3736339

Int. Cl.[5] **C30B** *35/00, 15/02;* **B65G** *31/00;* **A01C** *17/00*

U.S. Cl. 422—245 **20 Claims**



1. An arrangement for the continuous melting of silicon granulate in a melt reservoir that, based on the principle of communicating vessels, is in communication with the melt crucible for the continuous, horizontal drawing of silicon bands comprising:

a container for the melt reservoir, created as an annular covered crucible, having thermal insulation on all sides, and having an opening for granulate delivery through the cover;

a rotary plate, above the walls of the crucible, located on and perpendicular to the center axis of the annular crucible;

means for continuously varying between an upper and a lower limit value the angular speed of the rotary plate; and

a tubular collecting vessel for the silicon granulate is secured on the rotary plate the collecting vessel including an admission for the granulate in the direction of the rotational axis as well as a discharge opening in the direction of the annular melt reservoir.

4,940,569

SORBENT AND PROCESSES FOR REMOVING NITROGEN OXIDES, SULFUR OXIDES AND HYDROGEN SULFIDE FROM GAS STREAMS

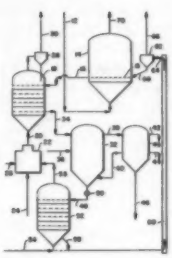
Lewis G. Neal, Danville, Calif.; John L. Haslbeck, Paducah, Ky., and Hsiaopin Tseng, Kansas City, Mo., assignors to Noxso Corporation, Library, Pa.

Division of Ser. No. 88,121, Aug. 21, 1987, Pat. No. 4,798,711, which is a division of Ser. No. 905,138, Sep. 9, 1986, Pat. No. 4,755,499, which is a continuation of Ser. No. 659,996, Oct. 12, 1984, abandoned. This application Sep. 20, 1988, Ser. No. 246,804

The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.

Int. Cl.[5] **B01D** *53/02;* **C01B** *21/00, 53/34*

U.S. Cl. 423—239 **3 Claims**



1. A process for the removal of nitrogen oxides and sulfur oxides from a sorbent containing them, comprising:

(a) removing said nitrogen oxides from a sorbent comprising:

(i) a gamma alumina substrate having a surface area between 100 m^2/g and 500 m^2/g and a pore volume between 0.4 and 0.8 cc/g, said gamma alumina substrate having a bimodal pore size disribution comprising micropores and macropores, said micropores having an average pore diameter d_1 in the range of between 30 and 400 Angstroms and said macropores having an average pore diameter d_2 in the range of between 80 and 3000 Angstroms,

(ii) an alkali metal component, said substrate impregnated with the alkali metal component and the amount of said alkali metal component being between 50 and 400 μg per m^2 of said substrate;

by contacting said nitrogen oxides and sulfur oxides containing sorbent with a stream of air heated to a temperature of above 532° C. and carrying said removed oxides away in a hot air stream; and

(b) subsequently, contacting said sulfur oxides containing sorbent with a regenerant stream of methane which reacts with the sorbed sulfur oxides to produce a stream of elemental sulfur and carrying said stream of elemental sulfur away.

4,940,570

BERYLLIUM-ALUMINUM-PHOSPHORUS-OXIDE MOLECULAR SIEVE COMPOSITIONS

Edith M. Flanigen, White Plains; Brent M. Lok, New City; Robert L. Patton, Katonah, and Stephen T. Wilson, Shrub Oak, all of N.Y., assignors to UOP, Des Plaines, Ill.

Continuation-in-part of Ser. No. 599,776, Apr. 13, 1984, abandoned. This application Mar. 3, 1986, Ser. No. 835,293
The portion of the term of this patent subsequent to Aug. 11, 2004, has been disclaimed.
Int. Cl.[5] C01B 25/36
U.S. Cl. 423—306 60 Claims

1. Crystalline molecular sieves having three-dimensional microporous framework structures of BeO_2, AlO_2 and PO_2 tetrahedral units having an empirical chemical composition on an anhydrous basis expressed by the formula:

$$mR:(Be_xAl_yP_z)O_2$$

wherein "R" represents at least one organic templating agent present in the intracrystalline pore system; "m" represents the molar amount of "R" present per mole of $(Be_xAl_yP_z)O_2$ and has a value of zero to about 0.3; and "x", "y" and "z" represent the mole fractions of beryllium, aluminum and phosphorus, respectively, present as tetrahedral oxides, said mole fractions being such that they are within the hexagonal compositional area defined by points A, B, C, D, E and F of FIG. 1, said crystalline molecular sieves having a characteristic X-ray powder diffraction pattern which contains at least the d-spacings set forth in one of the following Tables A to H and J to V:

TABLE A

	(BeAPO-5)	
2θ	d(Å)	Relative Intensity
7.3–7.65	12.1–11.56	m–vs
19.5–19.95	4.55–4.46	m–s
20.9–21.3	4.25–4.17	m–vs
22.2–22.6	4.00–3.93	w–vs
25.7–26.15	3.47–3.40	w–m

TABLE B

	(BeAPO-11)	
2θ	d(Å)	Relative Intensity
9.3–9.65	9.51–9.17	m–s
20.2–20.6	4.40–4.31	m–s
20.9–21.3	4.25–4.17	s–vs
22.0–22.5	4.04–3.95	m–s
22.5–23.0	3.95–3.87	m–s
23.1–23.4	3.85–3.80	m–vs

TABLE C

	(BeAPO-14)	
2θ	d(Å)	Relative Intensity
8.6–8.9	10.3–9.93	vs

TABLE C-continued

	(BeAPO-14)	
2θ	d(Å)	Relative Intensity
13.0	6.81	w
21.9–22.2	4.06–4.00	w
25.4	3.51	w
27.5	3.24	w
29.7	3.01	w

TABLE D

	(BeAPO-16)	
2θ	d(Å)	Relative Intensity
11.3–11.6	7.83–7.63	m–vs
18.7–18.9	4.75–4.70	w–s
21.9–22.3	4.06–3.99	m–vs
26.5–27.0	3.363–3.302	w–m
29.7–30.05	3.008–2.974	w–m

TABLE E

	(BeAPO-17)	
2θ	d(Å)	Relative Intensity
7.7–7.75	11.5–11.4	vs
13.4	6.61	s–vs
15.5–15.55	5.72–5.70	s
19.65–19.7	4.52–4.51	w–s
20.5–20.6	4.33–4.31	vs
31.8–32.00	2.812–2.797	w–s

TABLE F

	(BeAPO-18)	
2θ	d(Å)	Relative Intensity
9.6–9.65	9.21–9.16	vs
15.5–15.55	5.72–5.70	m
16.9–17.1	5.25–5.19	m
20.15–20.25	4.41–4.39	m
20.95–21.05	4.24–4.22	m
31.8–32.5	2.814–2.755	m

TABLE G

	(BeAPO-20)	
2θ	d(Å)	Relative Intensity
13.7–14.25	6.46–6.22	m–vs
19.55–20.0	4.54–4.44	w–s
24.05–24.6	3.70–3.62	m–vs
34.3–35.0	2.614–2.564	vw–w
42.5–43.1	2.127–2.098	vw–w

TABLE H

	(BeAPO-31)	
2θ	d(Å)	Relative Intensity
8.5–8.6	10.40–10.28	m–s
20.2–20.3	4.40–4.37	m
21.9–22.1	4.06–4.02	w–m
22.6–22.7	3.93–3.92	vs
31.7–31.8	2.823–2.814	w–m

TABLE J*

	(BeAPO-33)	
2θ	d(Å)	Relative Intensity
9.25–9.55	9.56–9.26	w–m
12.5–12.9	7.08–6.86	vs
16.9–17.3	5.25–5.13	w–m
20.45–20.9	4.34–4.25	w–m
23.85–24.25	3.73–3.67	w–m
26.05–26.35	3.42–3.38	w–m

TABLE J*-continued

	(BeAPO-33)	
2θ	d(Å)	Relative Intensity
27.3–27.6	3.27–3.23	vs

*as-synthesized form

TABLE K*

	(BeAPO-33)	
2θ	d(Å)	Relative Intensity
13.15–13.4	6.73–6.61	vs
18.05–18.35	4.91–4.83	m
18.4–18.6	4.82–4.77	m
26.55–26.7	3.36–3.34	m
32.0–32.1	2.80–2.79	m

*calcined form

TABLE L

	(BeAPO-34)	
2θ	d(Å)	Relative Intensity
9.4–9.8	9.41–9.02	s–vs
15.9–16.5	5.57–5.37	vw–m
17.85–18.6	4.97–4.77	w–s
20.3–21.3	4.37–4.17	m–vs
24.95–25.4	3.57–3.41	vw–s
30.3–30.8	2.95–2.81	w–s

TABLE M

	(BeAPO-35)	
2θ	d(Å)	Relative Intensity
10.8–11.1	8.19–7.97	m
17.2–17.4	5.16–5.10	s–vs
21.0–21.25	4.23–4.18	m–s
21.8–22.0	4.08–4.04	vs
31.8–32.2	2.814–2.788	m

TABLE N

	(BeAPO-36)	
2θ	d(Å)	Relative Intensity
7.7–8.1	11.5–10.9	vs
16.2–16.7	5.47–5.3	w–m
18.9–19.3	4.70–4.60	m–s
20.6–21.1	4.31–4.2	w–s
21.8–22.0	4.08–4.04	m

TABLE O

	(BeAPO-37)	
2θ	d(Å)	Relative Intensity
6.1–6.3	14.49–14.03	vs
15.5–15.7	5.72–5.64	w–m
18.5–18.8	4.80–4.72	w–m
23.5–23.7	3.79–3.75	w–m
26.9–27.1	3.31–3.29	w–m

TABLE P

	(BeAPO-39)	
2θ	d(Å)	Relative Intensity
9.4–9.6	9.41–9.21	w–m
13.3–13.6	6.66–6.51	m–vs
18.0–18.4	4.93–4.82	m
21.2–21.5	4.19–4.13	m–s
22.5–23.0	3.95–3.87	s–vs
30.2–30.5	2.96–2.93	w–m

TABLE Q

	(BeAPO-40)	
2θ	d(Å)	Relative Intensity
7.5–7.7	11.79–11.48	vw–m
8.0–8.1	11.05–10.94	s–vs
12.4–12.5	7.14–7.08	w–vs
13.6–13.8	6.51–6.42	m–s
14.0–14.1	6.33–6.28	w–m
27.8–28.0	3.209–3.187	w–m

TABLE R

	(BeAPO-41)	
2θ	d(Å)	Relative Intensity
13.6–13.8	6.51–6.42	w–m
20.5–20.6	4.33–4.31	w–m
21.1–21.3	4.21–4.17	vs
22.1–22.3	4.02–3.99	m–s
22.8–23.0	3.90–3.86	m
23.1–23.4	3.82–3.80	w–m
25.5–25.9	3.493–3.440	w–m

TABLE S

	(BeAPO-42)	
2θ	d(Å)	Relative Intensity
7.15–7.4	12.36–11.95	m–vs
12.5–12.7	7.08–6.97	m–s
21.75–21.9	4.09–4.06	m–s
24.1–24.25	3.69–3.67	vs
27.25–27.4	3.273–3.255	s
30.05–30.25	2.974–2.955	m–s

TABLE T

	(BeAPO-44)	
2θ	d(Å)	Relative Intensity
9.4–9.55	9.41–9.26	vs
13.0–13.1	6.81–6.76	w–m
16.0–16.2	5.54–5.47	w–m
20.6–20.85	4.31–4.26	s–vs
24.3–24.4	3.66–3.65	w–vs
30.7–30.95	2.912–2.889	w–s

TABLE U

	(BeAPO-46)	
2θ	d(Å)	Relative Intensity
7.2–8.1	12.3–10.9	vs
21.2–21.8	4.19–4.08	w–m
22.5–23.0	3.95–3.87	vw–m
26.6–27.2	3.351–3.278	vw–w
28.5–29.0	3.132–3.079	vw–w

TABLE V

	(BeAPO-47)	
2θ	d(Å)	Relative Intensity
9.4	9.41	vs
15.9–16.0	5.57–5.54	w–m
20.5–20.6	4.33–4.31	s
24.5–24.7	3.63–3.60	w
25.8–25.9	3.45–3.44	w
30.4–30.5	2.940–2.931	w

4,940,571

METHOD OF MAKING LARGE PARTICLE SIZE, HIGH PURITY DENSE SILICA

Sophia R. Su, Weston; Leo F. Fitzpatrick, Sandwich, and Sheryl A. Robillard, Leominster, all of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Apr. 1, 1988, Ser. No. 176,582
Int. Cl.[5] C01B 33/12
U.S. Cl. 423—339 8 Claims

1. A method of making silica comprising the following steps:

Step 1—mixing tetraalkylorthosilicate with a solvent to form a solution having a molar ratio of said tetraalkylorthosilicate to said solvent of about 1 to about 3;

Step 2—adding the product of step 1 to an ammonium hydroxide solution containing silicic acid forming a precipitate of hydrated silica in said ammonium hydroxide solution containing silicic acid;

Step 3—digesting the product of step 2;

Step 4—filtering the product of step 3 to separate the precipitate from the filtrate;

Step 5—drying the precipitate from step 4 to form a powder;

Step 6—heating the powder from step 5 under a vacuum to remove any H_2O and said solvent absorbed thereon;

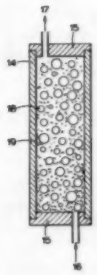
Step 7—heating the product of step 6 to form silica having a particle size from about 100 micrometers to about 420 micrometers and a surface area from about 0.2 m^2/g to about 0.3 m^2/g.

4,940,572

PROCESS FOR PREPARING AN IRON OXIDE

Roy D. Landon; Anthony J. Wickens, both of Surrey, and John H. W. Turner, Cheshire, all of England, assignors to Cookson Laminox Limited, Peterlee, United Kingdom

Division of Ser. No. 144,336, , Pat. No. 4,865,833, which is a division of Ser. No. 845,988, Mar. 31, 1986, abandoned, which is a division of Ser. No. 582,332, Feb. 22, 1984, Pat. No. 4,624,845.
This application Jul. 5, 1989, Ser. No. 375,859
Claims priority, application United Kingdom, Feb. 24, 1983, 8305145; Feb. 24, 1983, 8305146
Int. Cl.[5] C01G 49/06, 49/10
U.S. Cl. 423—633 9 Claims



1. In the process for the preparation of micaceous iron oxide comprising combining an iron chloride with at least one salt of an alkali metal or alkaline earth metal at sufficiently elevated temperatures to form a molten phase, and subjecting the resultant molten phase to oxidation with oxygen or oxygen-containing gas, the improvement which comprises carrying out the oxidation reaction on a solid surface such that the molten phase is distributed as a melt film on the solid surface, the melt film having a minimum thickness of 150 microns and the micaceous iron oxide being formed in the melt film.

4,940,573

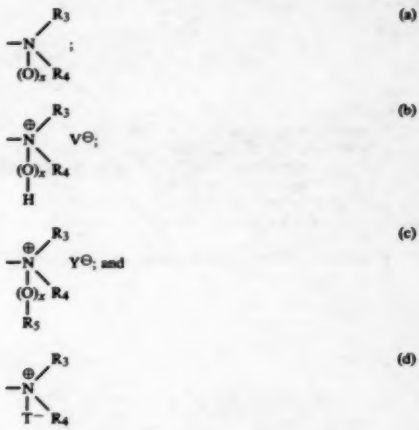
CATIONIC SURFACE-ACTIVE COMPOUNDS

Henri Sebag, Paris, and Guy Vanlerberghe, Claye-Souilly, both of France, assignors to L'Oreal, Paris, France

Division of Ser. No. 102,818, Sep. 23, 1987, Pat. No. 4,820,820, which is a continuation of Ser. No. 276,817, Jun. 24, 1981, abandoned. This application Dec. 9, 1988, Ser. No. 282,321
Claims priority, application France, Jun. 25, 1980, 80 14148
Int. Cl.[5] A61L 9/04
U.S. Cl. 424—45 8 Claims

1. A composition that is suitable for use in cosmetics comprising a diluent or a suitable cosmetic vehicle and at least one cationic surface active product selected from the group consisting of cationic surface-active product having the general formula:

wherein R_1 denotes a linear or branched, saturated or unsaturated aliphatic radical containing from 4 to 20 carbon atoms; R_2 is selected from the group consisting of a linear or branched alkyl radical having from 4 to 20 carbon atoms, a linear or branched alkoxymthyl radical in which the alkoxy portion has from 4 to 20 carbon atoms, and a linear alkenyloxy radical in which the alkenyl portion has from 4 to 20 carbon atoms; p denotes an integral or decimal number from 1 to 2.5; n denotes an integral or decimal number from 2 to 20, and G is a substituent group selected from the group of substituents consisting of the following:



in which x denotes 0 or 1; R_3 and R_4 independently denote an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms or, alternatively, R_3 and R_4 together with the nitrogen atom to which they are attached form a 5- or 6- membered heterocyclic ring; V denotes an anion of a mineral or organic acid; R_5 denotes an alkyl or hydroxyalkyl radical having from 1 to 3 carbon atoms; Y denotes an anion; and T denotes a methylcarboxylate or propylsulphonate anion.

4,940,574

NON-AQUEOUS HIGH SPF SUNSCREEN OILS

Carl Kaplan, Memphis, Tenn., assignor to Plough, Inc., Memphis, Tenn.

Filed Dec. 22, 1988, Ser. No. 289,335
Int. Cl.[5] A61K 7/40, 7/42, 7/44
U.S. Cl. 424—59 18 Claims

1. A non-aqueous high-SPF sunscreen oil comprising:

(a) about 20 to about 80 weight percent of at least one vola-

tile oil selected from the group consisting of a volatile silicone oil, a volatile C_{12}–C_{16} branched-chain hydrocarbon and mixtures thereof:

(b) about 10 to about 50 weight percent of at least one emollient selected from the group consisting of an ester of a straight or branched-chain C_{10}–C_{16} alcohol and a tri(lower-alkyl) substituted benzoic acid, an ester of a straight or branched C_{10}–C_{16} alcohol and a straight or branched chain C_4—C_{20} mono- or dicarboxylic acid, an ester of a branched-chain C_5–C_{10} glycol and a straight or branched-chain C_4–C_{20} mono- or dicarboxylic acid and mixtures thereof; and

(c) about 10 to about 35 weight percent of a sunscreen mixture of at least two UV-B sunscreens and at least one UV-A sunscreen.

4,940,575

4-HYDROXYISOXAZOLE DERIVATIVES, METHOD OF PREPARING SAME, AND COSMETIC AND PHARMACEUTICAL COMPOSITIONS CONTAINING THEM

Alexandre Zysman, and Henri Sebag, both of Paris, France, assignors to Société Anonyme dite:L'Oreal, Paris, France

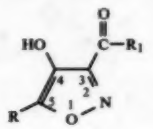
Filed Jun. 26, 1989, Ser. No. 371,058

Claims priority, application France, Jun. 27, 1988, 88 08612

Int. Cl.[5] A61K *31/19, 31/42, 31/445;* **C07D** *261/12*

U.S. Cl. 424—59 **11 Claims**

1. Derivatives of 4-hydroxyisoxazoles having the formula:



(I)

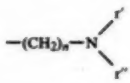
wherein:

R represents a linear or branched alkyl or hydroxyalkyl radical with 1 to 23 carbon atoms, a linear or branched alkenyl radical with 2 to 23 carbon atoms, a phenyl radical, or a benzyl radical, and

R_1 represents OR_2, —NHR_3, or —NH—NHR_4,

R_2 represents a hydrogen atom or an alkyl radical with 1 to 24 carbon atoms,

R_3 represents a hydrogen atom, an alkyl radical with 1 to 20 carbon atoms, or a



radical,

where n is 2 to 3 and r' and r'' are identical or different, representing a hydrogen atom or a lower alkyl radical or forming a morpholine, piperidine, or piperazine when taken together,

R_4 represents a hydrogen atom or a benzyl radical,

and salts of the formula (I) compounds.

4,940,576

HAIR CONDITIONING PREPARATION

Michael F. Walsh, South Wirral, United Kingdom, assignor to Conopco, Inc. d/b/a/ Chesebrough-Pond's USA Co., Greenwich, Conn.

Continuation of Ser. No. 510,117, Jul. 1, 1983, abandoned. This application Jun. 26, 1987, Ser. No. 67,434

Claims priority, application United Kingdom, Jul. 7, 1982, 8219673

Int. Cl.[5] A61K *7/06, 7/08*

U.S. Cl. 424—70 **1 Claim**

1. An aqueous clear single-phase liquid hair rinse conditioner composition comprising a water-soluble ionized polymer and an ionic surfactant of opposite charge which interact with each other to form a complex which separates out upon dilution of the composition as a lyotropic liquid crystal phase, the composition also comprising an effective amount of a clarifying agent to dissociate or dissolve the complex in order to maintain the composition in the form of a clear single-phase solution prior to dilution, the amount of the ionic surfactant being 0.9 to 2.0S moles where S Moles is the amount of the surfactant required to completely neutralize the charges on the polymer, the combined weight of the ionized polymer and the ionic surfactant being about 0.1 to about 5% by weight of the composition, said composition comprising not more than about 5% by weight of neutral surfactant, and said polymer being selected from the group consisting of poly(methacrylic acid), poly(styrene sulfonate) and copolymers of ethylene and maleic acid.

4,940,577

ESTER BASED WATER-IN-OIL COSMETIC MICROEMULSIONS

Stephen M. Greenberg, New York, and Louis A. Frischling, Lawrence, both of N.Y., assignors to Lipo Chemicals Inc., Paterson, N.J.

Filed Apr. 25, 1988, Ser. No. 185,860

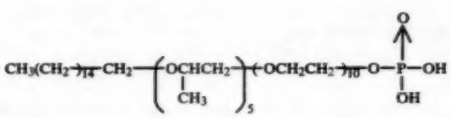
Int. Cl.[5] A61K *7/42, 7/44, 9/107*

U.S. Cl. 424—59 **18 Claims**

1. A clear, water-in-ester microemulsion composition comprising:

(a) water at about 2 to 15% by weight of the emulsion;

(b) as the sole emulsifier, a phosphate ester emulsifier having the empirical formula:



(c) at least one ester selected from the group consisting of neopentyl glycol dicaprylate/dicaprate, tridecyl stearate, tridecyl trimellitate, dipentaerythrityl hexacaprylate/hexacaprate, octyl palmitate and mixtures thereof.

4,940,578

HAIR PREPARATION

Toru Yoshihara; Jiro Kawase, both of Funabashi, and Yukihiro Fukuyama, Wakayama, all of Japan, assignors to Kao Corporation, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 202,983

Claims priority, application Japan, Jun. 18, 1987, 62-152376; Jun. 18, 1987, 62-152377

Int. Cl.[5] A61K *7/06, 7/075*

U.S. Cl. 424—70 **11 Claims**

1. A hair preparation which comprises particles of an oil-absorptive polymer of a vinyl monomer having a solubility parameter of 7 to 10, said vinyl monomer being an ester of a higher alcohol having 8 to 24 carbon atoms, said particles having an average particle diameter of 0.005 to 30 μm and a pore volume of at least 0.1 ml/g, said polymer having a squalene absorption of at least 1 ml/g, and a carrier.

4,940,579

TOPICAL APPLICATION OF MEDICAMENT IN A BINDER

Neil A. Randen, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Dec. 27, 1988, Ser. No. 290,579

Int. Cl.[5] A61K *31/74, 31/78, 13/02, 9/10*

U.S. Cl. 424—78 **25 Claims**

1. A liquid composition for topical application to the non-

mucosal, non-oral, skin and/or hair of a mammal comprising a solution, emulsion or dispersion of 0.25 to 10% by weight of an oil compatible pressure-sensitive adhesive polymer, 0.1to 50% by weight of a medicament, and 49.75 to 99.65% by weight of a carrier liquid, the ratio of said polymer to medicament being in the range of 1/5 to 1/50, said composition being incapable of forming a self-sustaining film when applied as a wet coating of 25 microns and dried.

4,940,580

SUSTAINED RELEASE LABETALOL TABLETS

Surendra Sangekar, New York, N.Y., and Winston A. Vadino, Whitehouse Station, N.J., assignors to Schering Corporation, Kenilworth, N.J.

Continuation of Ser. No. 926,306, Nov. 3, 1986, abandoned. This application Feb. 2, 1989, Ser. No. 306,253
Int. Cl.[5] A61K *31/79*; A01N *37/36*
U.S. Cl. 424—80 12 Claims

1. An oral sustained release dosage unit form solid tablet comprising a therapeutically effective amount of labetalol hydrochloride; 5–20% by weight of a polymeric binder comprising a combination of hydroxypropylmethylcellulose and polyvinylpyrrolidone; 20–35%, by weight, of pharmaceutically acceptable organic acid having a pk 1 of 2–4; and optionally pharmaceutically acceptable excipients.

4,940,581

PLATELET CRYOPRESERVATION

James M. Mason, and David D. Pifer, both of Memphis, Tenn., assignors to The University of Tennessee Research Corporation, Knoxville, Tenn.

Continuation-in-part of Ser. No. 924,964, Oct. 30, 1986, Pat. No. 4,764,463. This application Aug. 15, 1988, Ser. No. 233,999
Int. Cl.[5] A61K *35/14*
U.S. Cl. 424—532 5 Claims

1. In a method for the preservation of blood platelets wherein the platelets are frozen in a concentrated state in the presence of a sufficient quantity of prostacyclin for the substantially complete inhibition of platelet function and subsequently thawed in the presence of prostacyclin and at a pH below about 8, the improved step comprising the substantially continuous addition to said thawed concentrate of a sufficient quantity of a diluent to reduce the concentration of the platelets to that quantity acceptable for infusion, and thereafter incubating said diluted platelets at about 37° C. to permit said platelets to substantially recover their pre-freezing morphology.

4,940,582

ANTIBIOTIC YI-HU3

Tetsuji Iwasaki, and Toshio Uesaka, both of Wakayama, Japan, assignors to Kao Corporation, Tokyo, Japan

PCT No. PCT/JP87/01007, § 371 Date Aug. 15, 1988, § 102(e) Date Aug. 15, 1988, PCT Pub. No. WO88/04661, PCT Pub. Date Jun. 30, 1988
PCT Filed Dec. 21, 1987, Ser. No. 243,033
Claims priority, application Japan, Dec. 23, 1986, 61-307164
Int. Cl.[5] A61K *35/74*; C12R *1/38*; C07G *11/00*; C12P *1/04*
U.S. Cl. 424—115 1 Claim

1. Antibiotic YI-HU3 having the following physicochemical characteristics:

(a) Molecular weight
469

(b) Melting point
180°–190° C.

(c) Ultraviolet absorption spectrum (in chloroform)
The maximum absorption is found in the neighborhood of 312 nm, with the second largest absorption being in the neighborhood of 300 nm.

(d) Infrared absorption spectrum (KBr Method)
FIG. 2

(e) ^{1}H—NMR spectrum ($CDCl_3/CD_3OH$)
FIG. 3

(f) ^{13}C—NMR spectrum ($CDCl_3/CD_3OH$)
FIG. 4

(g) Solubility to solvents
Soluble in methanol and chloroform, and not soluble in n-hexane.

(h) Color and state of the substance
Light yellow crystals.

4,940,583

ANIMAL REPELLENT COMPOSITION AND METHOD

Ian A. Thompson, New South Wales, Australia, assignor to R & C Products Pty. Limited, Chatswood, Australia

Filed Nov. 2, 1987, Ser. No. 116,049
Int. Cl.[5] H01N *33/00*
U.S. Cl. 424—195.1 15 Claims

1. An animal repellent composition consisting essentially of (1) a first component which consists essentially of orange oil, terpinolene, diphenyl ether, geranium oil, diethyl phthalate, cinnamaldehyde and methyl salicylate, and (2) and a second component which is a sufficient quantity of ipecacuanha to provide an alkaloid concentration as emetine of about 0.01%.

4,940,584

FRAGRANCE ENHANCED POWDER SAMPLER AND METHOD OF MAKING THE SAME

Christopher Tararuj, Mercerville, and Carl K. Schaab, Princton Jct., both of N.J., assignors to Webcraft Technologies, N. Brunswick, N.J.

Filed Jun. 17, 1988, Ser. No. 207,949
Int. Cl.[5] A61K *6/00*
U.S. Cl. 424—401 9 Claims

1. A fragrance particle sampler, comprising:

(a) a substrate having a smooth surface,

(b) a layer of readily removable dry adhesively held fragranced powder particles disposed on and lightly adherent to the smooth surface of the substrate,

(c) the particles being mixed with a large amount of fragrance oil and surface-coated with a heavy molecular weight oil/wax for sealing in the fragrance and promoting adhesion/cohesion between adjacent particles in the layer binding the particles together,

(d) the powder particles being held temporarily in fixed position with respect to each other by the set taken by the coating on the particles binding them together,

(e) the coating on the particles and the binding material taking a set within the layer as a residual dried layer after evaporation of the volatile liquid suspension medium originally mixed with the applied layer, whereby the particles lightly adhere to the substrate surface, and on application of light finger pressure are removable therefrom as discrete free-flowing separate particles, having the property of a fragranced powder.

4,940,585

METHOD FOR THE TREATMENT OF NICOTINE WITHDRAWAL SYNDROME

William E. Hapworth, and Mada S. Hapworth, both of 250 W. 57th St., New York, N.Y. 10019

Filed Feb. 17, 1989, Ser. No. 312,954
Int. Cl.[5] A61K 9/20, 9/14, 9/48, 31/135
U.S. Cl. 424—464 20 Claims

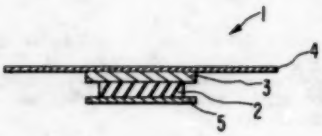
1. A therapeutic method for treatment of nicotine withdrawal syndrome symptoms of a patient in need thereof which comprises administering to said patient a composition comprising a pharmaceutically acceptable carrier and fluoxetine in an amount between about 5 and about 40 milligrams per day so as to inhibit the reuptake of serotonin in the neurohumoral pathways of the central nervous system of said patient, so that physiological relief from said withdrawal symptoms is provided.

4,940,586

SKIN PERMEATION ENHANCER COMPOSITIONS USING SUCROSE ESTERS

Yu-Ling Cheng, Cupertino; Robert M. Gale, Los Altos; Edna Sugihara, Mountain View, and Harold F. Sanders, San Jose, all of Calif., assignors to Alza Corporation, Palo Alto, Calif.

Division of Ser. No. 19,422, Feb. 26, 1987, Pat. No. 4,865,848.
This application Oct. 13, 1988, Ser. No. 257,487
Int. Cl.[5] A61K 9/24
U.S. Cl. 424—464 6 Claims



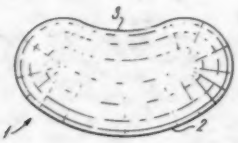
1. A composition of matter for application to skin to deliver a biologically active agent by permeation therethrough comprising, in combination: a biologically active agent and a permeation enhancing amount of a permeation enhancer consisting essentially of sucrose monolaurate mixed with sucrose esters of coconut fatty acids said composition being dispersed within a physiologically compatible matrix or carrier.

4,940,587

ORAL PHARMACEUTICAL COMPOSITION THROUGH MUCOSA

Anthony W. Jenkins; Stewart T. Leslie, both of Cambridge, United Kingdom, and Ronald B. Miller, Basel, Switzerland, assignors to Euroceltique, S.A., Luxembourg, Luxembourg

Filed Jun. 3, 1986, Ser. No. 870,027
Claims priority, application United Kingdom, Jun. 11, 1985, 8514665
Int. Cl.[5] A61K 9/36; A61F 9/02
U.S. Cl. 424—480 18 Claims



1. Arrangement adapted for application and adherence to the mucosa of the oral or nasal cavity for sustained release there of an orally administerable drug, said arrangement comprising a body having an orally administerable drug distributed therein and having a size and shape suitable for insertion into and retention in the oral or nasal cavity, said body being formed of granules of a higher aliphatic alcohol of 8–18 carbon atoms and a hydrated water soluble hydroxyloweralkyl cellulose having said drug distributed therethrough and being coated with a cellulose derivative which is adherent to the mucosa, whereby upon insertion into the oral or nasal cavity said body adheres to the mucosa thereof and the drug is there slowly released and absorbed.

4,940,588

CONTROLLED RELEASE POWDER AND PROCESS FOR ITS PREPARATION

Randall T. Sparks, Gainesville, Ga., and Edward J. Geoghegan, Athlone, Ireland, assignors to Elan Corporation, Athlone, Ireland

Continuation of Ser. No. 792,801, Oct. 30, 1985, abandoned.
This application Mar. 17, 1988, Ser. No. 171,131
Claims priority, application Ireland, Oct. 30, 1984, 2788/84
Int. Cl.[5] A61K 9/14, 9/16
U.S. Cl. 424—490 7 Claims

1. A controlled release taste-masked powder containing discrete micro-particles for use in edible, pharmaceutical and other controlled release compositions, said powder comprising particles containing theophylline as an active ingredient in intimate admixture with two polymers, cellulose acetate butyrate and polyvinylpyrrolidone, in an amount effective to provide a predetermined and controlled release of said active ingredient, each of said particles being in the form of a micromatrix with the active ingredient uniformly distributed throughout the matrix, but not entirely coated by the polymers, said particles having an average size of from 0.1 to 125 μm, being unlikely to be significantly degraded or ground by any chewing action, and wherein said predetermined release of active ingredient is suitable for twice daily administration.

4,940,589

USE OF AQUEOUS THAUMATIN TO ENHANCE SWEETNESS OF CHEWING GUM

Albert H. Chapdelaine, Naperville, and Robert J. Yatka, Orland Park, both of Ill., assignors to Wm. Wrigley Jr. Company, Chicago, Ill.

Filed Dec. 6, 1988, Ser. No. 280,492
Int. Cl.[5] A23G 3/30
U.S. Cl. 426—3 6 Claims

1. A method of making a chewing gum including thaumatin comprising the following steps:

providing an aqueous thaumatin solution comprising thaumatin and a water miscible preservative wherein thaumatin is present in an amount from about 1% to about 25% by weight of the aqueous thaumatin solution, and the water miscible preservative is present in an amount from about 15% to about 60% by weight of the aqueous thaumatin solution;

providing a chewing gum composition; and

mixing the aqueous thaumatin solution and chewing gum composition so that thaumatin comprises from about 25 ppm to about 600 ppm by weight of the chewing gum composition.

4,940,590

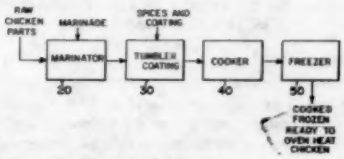
MARINATED MEAT AND POULTRY PRODUCTS HAVING A GLAZED COATING AND METHOD FOR PRODUCING SUCH PRODUCTS

Charles E. Williams, Moorefield, W. Va., and J. Leon Kusher, Creve Coeur, Mo., assignors to Hester Industries, Inc., Moorefield, W. Va.

Continuation of Ser. No. 129,941, Nov. 20, 1987, abandoned, Ser. No. 799,173, Nov. 18, 1985, abandoned, Ser. No. 798,964, Nov. 18, 1985, abandoned, and Ser. No. 804,581, Dec. 12, 1985, abandoned, said Ser. No. 129,941, is a continuation-in-part of Ser. No. 755,274, Jul. 15, 1985, abandoned, which is a division of Ser. No. 714,815, Mar. 22, 1985, abandoned, which is a continuation-in-part of Ser. No. 669,854, Nov. 9, 1984, abandoned, said Ser. No. 799,173, is a continuation-in-part of Ser. No. 714,815, , said Ser. No. 798,964, is a continuation-in-part of Ser. No. 669,854, , said Ser. No. 804,581, is a continuation-in-part of Ser. No. 669,854,. This application Aug. 18, 1988, Ser. No. 233,377

Int. Cl.[5] A23L *1/31, 1/315, 1/318*

U.S. Cl. 426—92 69 Claims



1. The method of coating and cooking raw meat and raw poultry parts comprising the steps of:

tumbling said parts in a quantity of marinade until the marinade is substantially absorbed into the parts and the outer surface of the parts carries a thin, uniformly disposed adhesive myosin muscle protein binder coating;

rubbing said parts with a dry binder coating by tumbling said parts in the presence of a dry coating mixture consisting essentially of a proportion of natural sugar solids and a proportion of natural spices, coloring agents and flavoring agents to disperse said dry coating mixture in said myosin muscle protein binder coating and to form therewith a thin, elastic, firmly adherent outer glazing coat, said dry coating mixture serving to create uniform color upon baking; and

baking the coated parts in dry heat to cook and seal the glazing coat in place to form a glazed coating and to retain the marinade.

4,940,591

MICROWAVABLE STUFFING MIX

Jatinder P. Sabhlok, Lawrenceville; William J. Horan, Mt. Holly, and Donna K. Carlton, Chester, all of N.J., assignors to Kraft General Foods, Inc., Glenview, Ill.

Filed Mar. 21, 1989, Ser. No. 326,718

Int. Cl.[5] A23B *4/10*; A21D *13/00*

U.S. Cl. 426—94 8 Claims

1. A dry microwavable instant stuffing mix which can be prepared by mixing with water and cooking in a microwave oven for about three minutes, comprised of an uncoated, coarse bread crumb fraction, an uncoated, fine bread crumb fraction and a medium bread crumb fraction which has been surface-coated with both a vegetable oil at a level of from about 5 to 25% by weight of the medium crumb fraction and a powdered seasoning blend at a level of from about 5 to 15% by weight of the medium crumb fraction, wherein the coarse fraction is retained on a No. 2.5 Tyler screen, the fine fraction passes through a No. 14 U.S. Standard Sieve and the medium fraction passes through a No. 2.5 Tyler screen and is retained on a No 14 U.S. Standard Sieve and wherein the weight ratio of coarse:fine:medium crumb fractions is 1:0.08–1.3:2.8–4.0.

4,940,592

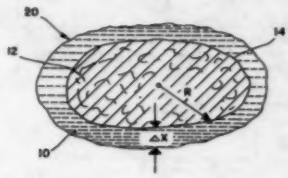
PROCESS FOR MICROWAVE CHOCOLATE FLAVOR FORMATION IN AND/OR ON FOODSTUFFS AND PRODUCTS PRODUCED THEREBY

Brian Byrne, East Brunswick; Kevin P. Miller, Middletown; Chee-Teck Tan, Middletown; Lawrence L. Buckholz, Jr., Middletown, and Marion A. Sudol, Boonton, all of N.J., assignors to International Flavors & Fragrances Inc., New York, N.Y.

Filed Jun. 26, 1989, Ser. No. 371,635

Int. Cl.[5] A23L *1/227*; A21D *2/00*

U.S. Cl. 426—94 8 Claims



1. A process for providing a cooked baked goods foodstuff having an intense chocolate flavor comprising the steps of:

(a) providing an uncooked baked goods composition;

(b) providing a mixture of precursors of a chocolate flavor reaction product having a pH of from about 9 up to about 13 consisting essentially of phenyl alanine, leucine, a sugar selected from the group selected from the group consisting of rhamnose, ribose and cerelose and a solvent which is capable of raising the dielectric constant of the foodstuff to be cooked selected from the group consisting of glycerine, propylene glycol, mixtures of glycerine and propylene glycol, mixtures of glycerine and ethanol, and mixtures of propylene glycol and ethanol;

(c) either coating the mixture of (b) onto the uncooked baked composition provided in (a) or intimately admixing the mixture of (b) with the uncooked baked goods composition provided in (a); and

(d) exposing the thus treated uncooked foodstuff to microwave radiation for a period of time sufficient to cause a chocolate flavor profile to be imparted to the foodstuff.

4,940,593

MULTICOLORED R-T-E CEREAL AND METHOD OF PREPARATION

David K. Duffy, Maple Grove, Minn., assignor to General Mills, Inc., Minneapolis, Minn.

Filed Apr. 24, 1989, Ser. No. 342,155

Int. Cl.[5] A23L *1/118, 1/64*

U.S. Cl. 426—94 29 Claims

1. A method for preparing a single layer multicolored R-T-E cereal piece, comprising the steps of:

A. providing a plurality of separate segregated quantities of low moisture cooked cereal pellets, comprising a first and second quantity of cooked cereal pellets,

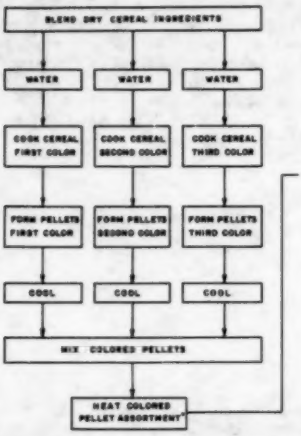
said first quantity of warm pellets having a first color and said second quantity of warm pellets having a second color,

wherein all the cereal pellets have a temperature ranging from about 255° to 310° F., and a moisture content ranging from about 18% to 26% by weight;

B. separately cooling the quantities of warm, low moisture pellets to a temperature ranging from about 60° to 120° F. while maintaining the moisture content to form cooled low moisture pellets;

C. admixing the cooled, low moisture pellets while cool with low shear mixing to form a mixed assortment of cooled, low moisture pellets of first and second color;

D. heating the assortment of pellets to a temperature of about 160° to 180° F. to soften the pellets to form an assortment of warm, softened pellets having a moisture content of about 18% to 26% by weight;



E. sheeting the pellets to form a sheet comprising a plurality of regions of random shape, each region having only one color;

F. forming the sheet into pieces; and

G. forming the pieces into ready-to-eat cereal pieces.

4,940,594

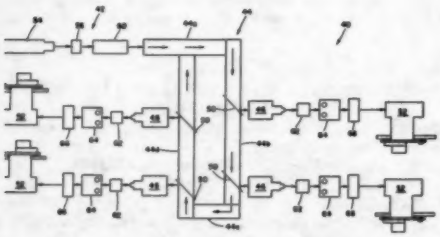
METHOD FOR PROCESSING CHEWING GUM

Terrance L. Van Alstine, Palatine Bridge, N.Y., assignor to Nabisco Brands, Inc., East Hanover, N.J.

Division of Ser. No. 179,467, Apr. 8, 1988, Pat. No. 4,882,172. This application Aug. 15, 1989, Ser. No. 394,028

Int. Cl.[5] A23G *7/00*

U.S. Cl. 426—231 **10 Claims**



1. A method for processing a chewing gum composition comprising the steps of:

forming a mass of the gum composition;

cutting said mass into a multitude of segments;

feeding the segments onto a conveyor means;

feeding gum segments from the conveyor means into a plurality of extruders;

extruding a rope of gum from each extruder; and

cutting each rope into a multitude of pieces, and wrapping each piece.

2. A method according to claim 1, wherein the conveyor means forms a closed, endless path, and the step of feeding gum segments from the conveyor means into the extruders includes the steps of:

feeding selected gum segments from the conveyor means into the extruders; and

recirculating around the conveyor means, gum segments not fed to any of the extruders.

3. A method according to claim 2, wherein the step of feeding selected gum segments into the extruders comprises the step of:

sensing the amount of gum in each extruder; and

when the amount of gum in any one of the extruders falls below a given value, diverting gum from the conveyor means and into said one extruder.

4,940,595

CONTROLLING THE TEXTURE OF MICROWAVE BROWNIES

John J. Yasosky, Maple Grove; Patricia W. Hahn, Plymouth, and William A. Atwell, Andover, all of Minn., assignors to The Pillsbury Company, Minneapolis, Minn.

Division of Ser. No. 113,129, Oct. 27, 1987. This application Sep. 26, 1988, Ser. No. 249,017

Int. Cl.[5] A21D *13/8*

U.S. Cl. 426—243 **3 Claims**

1. A method for controlling the texture of brownies baked from a batter in a microwave oven comprising controlling the maximum internal temperature of the brownie during microwave baking wherein the maximum internal temperature of at least 70% of the total volume of the brownie is less than about 140°C.

4,940,596

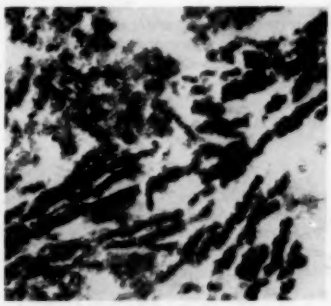
PROCESS FOR METAL FIBERS

Robin E. Wright, St. Paul, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Division of Ser. No. 62,437, Jun. 12, 1987, abandoned. This application Nov. 16, 1988, Ser. No. 272,076

Int. Cl.[5] H01F *10/02*

U.S. Cl. 427—47 **33 Claims**



1. A process comprising the steps:

(a) preparing a mixture comprising a labile ligand stabilized zerovalent metal complex wherein said complex comprises at least one ferromagnetic metal and at least one ligand selected from the group consisting of unsaturated aliphatic compounds, aromatic compounds, and organic solvents, all of which are capable of forming labile solvated zerovalent metal complexes, and an organic liquid medium, and

(b) applying energy to said mixture in the presence of an externally applied magnetic field to decompose said complex and provide a slurry of ferromagnetic metal fibers dispersed in said organic liquid medium.

4,940,597

METHOD OF LUBRICATING THE PASSAGE OF MEAT EMULSION THROUGH THE STUFFING HORN OF A MEAT EMULSION ENCASING MACHINE

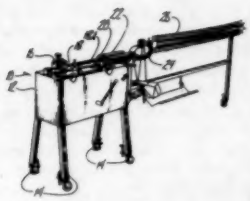
Ray T. Townsend, Des Moines, Iowa, assignor to Townsend Engineering Company, Des Moines, Iowa

Continuation of Ser. No. 106,172, Oct. 6, 1987. This application Dec. 13, 1988, Ser. No. 283,834

The portion of the term of this patent subsequent to Apr. 4, 2006, has been disclaimed.

Int. Cl.[5] A22C *11/02*

U.S. Cl. 426—413 9 Claims



1. A method of lubricating a meat emulsion, comprising the steps of:

introducing meat emulsion into an emulsion stuffing tube, said tube having an emulsion intake end and an emulsion discharge end,

extruding said emulsion in tubular form from said tube by subjecting the meaty emulsion to pressure to move said emulsion from the intake end to the discharge end of said tube,

introducing a film of lubricating fluid into said tube near the emulsion intake end of said tube, said film being in intimate contact with the interior of said tube and the outer surface of said meat emulsion for substantially the entire length of said tube to eliminate emulsion smear along the entire length of said tube, and

holding said tube against rotation.

4,940,598

PROCESS FOR THE RAPID REHYDRATION OF LEGUMES AND THE LIKE

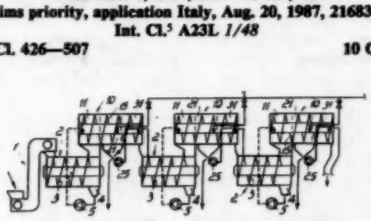
Giuseppe Zanichelli, Parma, Italy, assignor to Zanichelli Meccanica S.P.A., Parma, Italy

Filed Dec. 4, 1987, Ser. No. 129,012

Claims priority, application Italy, Aug. 20, 1987, 21683 A/87

Int. Cl.[5] A23L *1/48*

U.S. Cl. 426—507 10 Claims



1. A process for rapid rehydration of dried legumes, comprising the steps of subjecting the legumes to a treatment with hot fluid having a temperature substantially above 80° C. for a preset time interval, then subjecting the legumes to a treatment with cold fluid having a temperature substantially below 60° C. for another preset time interval, with said cold fluid having a temperature lower than said hot fluid of at least 30° C., and repeating said treatments with hot and cold fluid until a preset rehydration percentage is attained with a total treatment time of about 30 to 40 minutes.

4,940,599

METHOD OF PRODUCING FRESH MEAT IN WHICH SUBSTANTIAL MOISTURE LOSS DURING PRODUCTION IS REDUCED

Sid V. Engler, 255 Brimley Road, Scarborough, Ontario, Canada M1M 3J2, and George Cobb, 307 Bishop Street North, Cambridge, Ontario, Canada N3H 2K2

Filed Aug. 2, 1989, Ser. No. 388,438

Int. Cl.[5] A23L *1/00*

U.S. Cl. 426—524 16 Claims

1. A method of chilling a carcass in which moisture loss during chilling is substantially reduced; said method comprising the steps of:

applying liquid to the carcass;

subjecting the carcass to a supercold environment, so that a thin ice layer forms around the carcass; said carcass being subjected to said environment for a period of time short enough to substantially prevent freezing of the outermost layers of the flesh of the carcass, but long enough to allow for formation of said ice layer;

cooling the ice-layer-protected carcass for a further period of time long enough to lower the temperature of the flesh to a point where substantial deterioration of the flesh is prevented, but short enough to prevent freezing of the flesh.

4,940,600

PROCESS FOR PRODUCING DRIED CHEESE

Hitoshi Yokoyama, Sennan; Hiroyuki Sano, Kishiwada; Akiko Horimoto, and Masatoshi Kizaki, both of Sennan, all of Japan, assignors to Fuji Oil Company, Limited, Osaka, Japan

Filed Dec. 22, 1987, Ser. No. 136,635

Claims priority, application Japan, Dec. 23, 1986, 61-314643; May 27, 1987, 62-132271

Int. Cl.[5] A23C *19/00*

U.S. Cl. 426—582 13 Claims

1. A process for producing dried shaped cheese which comprises stirring a water-containing raw material mixture which contains emulsified cheese obtained by heat melting the cheese at 70° to 100° C. with the aid of an emulsifying salt, said emulsified cheese being present in an amount of at least 10% by weight, based on the total amount of cheese used, at a temperature not higher than 50° C. with addition of water during stirring, placing the thus-obtained raw material in a container to shape it and freeze-drying the mixture in a shaped state.

4,940,601

SUCROSE FATTY ACID ESTER COMPOSITIONS AND SHORTENINGS AND MARGARINES MADE THEREFROM

Peter D. Orphanos, Cincinnati; Christian A. Bernhardt, Fairfield; Bryan L. Madison, Cincinnati; Paul Seiden, Cincinnati; Albert M. Ehrman, Cincinnati; John R. Baginski, Loveland, and Timothy B. Guffey, West Chester, all of Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Continuation of Ser. No. 176,712, Apr. 15, 1988, abandoned, which is a continuation-in-part of Ser. No. 47,367, May 6, 1987, abandoned. This application Jul. 11, 1989, Ser. No. 378,552

Int. Cl.[5] A23D *5/00*

U.S. Cl. 426—601 24 Claims

16. A shortening composition comprising:

(a) from about 10% to about 80% by weight of a sucrose fatty acid ester composition comprising:

(i) from about 60% to about 97% by weight intermediate melting sucrose fatty acid esters containing at least four fatty acid ester groups, each fatty acid group has from about 8 to about 22 carbon atoms, wherein the intermediate melting sucrose fatty acid esters have an iodine value between about 25 and about 55, from about 5% to about 50% solids at body temperature, a viscosity of not less than 15 poise at 100° F. (37.8° C.) after 10 minutes

of steady shear at 10 sec.$^{-1}$, and a liquid/solid stability of not less than 90% at 100° F. (37.8° C.);

(ii) from about 3% to about 40% by weight first hardstock material selected from the group consisting of hardstock triglycerides and hardstock polyol fatty acid esters, and mixtures thereof, wherein the hardstock has an iodine value not more than about 12, and wherein the average fatty acid chain length of the hardstock material fatty acids is not less than about the average fatty acid chain length of the intermediate melting sucrose ester fatty acids;

(b) from about 20% to about 90% by weight soft oil;

(c) from about 0% to about 50% by weight intermediate melting triglyceride;

(d) from about 0% to about 20% by weight second hardstock material selected from the group consisting of hardstock triglycerides and hardstock polyol fatty acid esters, and mixtures thereof, wherein the second hardstock material has an iodine value not more than about 12, and wherein the average fatty acid chain length of the second hardstock material fatty acids is less than the average fatty acid chain length of the intermediate melting sucrose ester fatty acids; and

(e) from about 0% to about 15% other shortening ingredients.

4,940,602

PROCESS OF PRODUCING AN ANTI-REFLECTION OPTICAL ARTICLE

Takashi Taniguchi, Yasu, and Tetsuya Seki, Kyoto, both of Japan, assignors to Toray Industries, Inc., Tokyo, Japan

Division of Ser. No. 114,061, Oct. 29, 1987, Pat. No. 4,904,525. This application Aug. 25, 1989, Ser. No. 398,473

Claims priority, application Japan, Feb. 13, 1987, 62-29702

Int. Cl.^{5} B05D *3/06*

U.S. Cl. 427—40 **5 Claims**

1. A process for producing an anti-reflection optical article which comprises:

providing a transparent plastic substrate on which a hard coat film having an index of refraction of not less than 1.52 is formed;

applying a liquid coating composition comprising a fluorine-containing organic silicon compound and/or a hydrolysate thereof, on the hard coat film; and

curing the applied composition to form a fluorine-containing organopolysiloxane-based film with an index of refraction lower than that of the hard coat film by not less than 0.02.

4,940,603

THIN FILM INORGANIC SCINTILLATOR AND METHOD OF MAKING SAME

Peter K. Soltani, Olney, Md., assignor to Quantex Corporation, Rockville, Md.

Filed Jun. 30, 1988, Ser. No. 213,347

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.^{5} B05D *5/06, 5/12;* **C09K** *11/08*

U.S. Cl. 427—66 **15 Claims**

1. A process for making a luminescent article, comprising the steps of:

providing a substrate;

depositing upon said substrate using thin film deposition techniques a material comprising a base material selected from the group consisting of alkaline earth metal sulfides and alkaline earth metal selenides, a dopant selected from the group of cerium and emporium, and a flux; and heating said material to a sufficient temperature for a sufficient period of time to affect recrystallization and activation of said material such that said material becomes a non-storage luminescent material.

4,940,604

METHOD FOR PRODUCTION OF COPPER INDIUM DISELENIDE

Naoki Suyama, Osaka; Noriyaki Ueno, Nara; Kuniyoshi Omura, Osaka; Hazime Takada, Osaka; Yuutaro Kita, Osaka, and Mikio Murozono, Osaka, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Sep. 2, 1988, Ser. No. 239,742

Claims priority, application Japan, Sep. 4, 1987, 62-222316

Int. Cl.^{5} B05D *5/12;* **H01L** *31/00*

U.S. Cl. 427—76 **7 Claims**

1. A method of producing a copper indium diselenide film which comprises adding a liquid cooling medium to a mixture of Cu, In and Se powders, said liquid cooling medium being selected from the group consisting of water, ethylene glycol monophenyl ether, propylene glycol and perfluorobutyltetrahydrofuran, grinding the resulting mixture using a mill to give a slurry containing a ground powder including $CuInSe_2$ of low crystallinity, drying and adding a binding agent to said slurry to give a paste, wherein said binding agent is propylene glycol, coating a substrate with said paste, and sintering the paste so applied under a nitrogen atmosphere to form a polycrystalline $CuInSe_2$ film.

4,940,605

ELECTRODE FOR ELECTROCHEMICAL CELL

Frederick W. Dampier, Watertown, and Richard M. Mank, Needham, both of Mass., assignors to Whittaker Technical Products, Inc., Pawcatuck, Conn.

Filed Jun. 9, 1986, Ser. No. 872,325

Int. Cl.^{5} B05D *5/12*

U.S. Cl. 427—77 **17 Claims**

1. The method of fabricating a flexible positive electrode for a rechargeable non-aqueous electrochemical cell comprising the steps of

mixing a quantity of a metal halide active electrode material and a quantity of a conductive carbonaceous material to provide a mixture consisting essentially of the metal halide and the conductive carbonaceous material, the metal halide being selected from the group consisting of cupric chloride, nickel, chloride, silver chloride, cobalt chloride and chromium chloride;

adding a quantity of a mechanical binder which is inert in the electrochemical cell to the mixture;

mixing to provide a uniform mixture of the ingredients;

adding a quantity of non-aqueous liquid which is a volatile halogenated organic solvent to the mixture, said metal halide having a low solubility in the liquid and being inert with respect to the liquid whereby there is no chemical reaction between the metal halide and the liquid;

mixing to provide a uniform, viscous slurry consisting essentially of the metal halide, the conductive carbonaceous material, the mechanical binder, and the non-aqueous liquid; pasting the slurry on an inert, electrically-conductive substrate;

drying the pasted slurry; and

curing the dried slurry for a time sufficient to remove substantially all of the liquid and to stabilize the mechanical binder thereby providing a positive electrode structure.

4,940,606

METHOD OF INCREASING THE LUBRICANT RETENTION OF MAGNETIC DISKS

Heinz Hilgers, Mainz; Rainer Morbitzer, Mainz-Kostheim, and Johannes Windeln, Bodenheim, all of Fed. Rep. of Germany, assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 26, 1989, Ser. No. 456,758
Claims priority, application European Pat. Off., Dec. 24, 1988, 88121667.5
Int. Cl.[5] H01F *10/02*; B05D *5/12*
U.S. Cl. 427—130 11 Claims

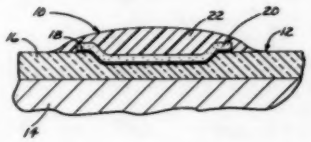
1. A method of manufacturing a magnetic record carrier of the type wherein the magnetic layer on the carrier is a coating formulation of magnetic particles dispersed in a curable organic binder system and solvents or mixtures thereof and an additive, the magnetic layer being applied to a substrate and cured, the method comprising the steps of heating said magnetic layer in an inert gas for a given time to a given temperature, and thereafter heating said layer in an inert gas to which oxygen has been added, for a given time to a given temperature.

4,940,607

METHOD OF PATCHING LINERS OF LARGE GLASS-LINED REACTORS

Scott R. Culler, and David L. Wakefield, both of St. Paul, Minn., assignors to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Sep. 6, 1988, Ser. No. 241,089
Int. Cl.[5] B32B *35/00*
U.S. Cl. 427—140 10 Claims



1. Method of patching a defect in a glass-lined reactor comprising the steps of

(a) applying to the defect a solution of substantially fully hydrolyzed organofunctional silanol and allowing it to dry to provide a thin primer that contains a silane coupling agent,

(b) applying a composite comprising silane-treated ceramic microparticles in a polymerizable resin containing functional groups that can covalently bond to silane, and

(c) then curing the resin of the composite.

4,940,608

LOCAL ELECTROLESS PLATING PROCESS FOR PLASTICS

Shigemitsu Kawagishi, Suita, and Toshiyuki Kita, Nara, both of Japan, assignors to Okuno Chemical Industry Co., Ltd., Japan

Filed Nov. 7, 1988, Ser. No. 268,051
Int. Cl.[5] B05D *5/00, 1/32, 3/10*
U.S. Cl. 427—259 18 Claims

1. A local electroless plating process for plastics comprising the steps of:

(1) coating the nonplating surface portion of a shaped plastics product with a pasty masking composition comprising a polymer and at least one compound selected from the group consisting of a sulfur compound, nitrogen compound and silicon compound;

(2) roughening the surface portion of the plastics product to be plated and applying a catalyst to the rough-surfaced portion;

(3) electrolessly plating the plastics product; and

(4) thereafter removing the polymer coating from the nonplating surface portion of the plastics product by use of absolute ethanol, absolute methanol, or a mixture of 85 to 90% ethanol or methanol and 15 to 10% of 25% ammonia water;

wherein the sulfur compound contained in the masking composition, is at least one compound selected from the group consisting of potassium xanthate, potassium dibutyldithiocarbamate, thiourea, thiourea derivatives, thioethanol, mercaptobenzothiazole, mercaptobenzodiol, thiosemicarbazide, thioglycollic acid and mercaptan;

wherein the nitrogen compound contained in the masking composition, is at least one compound selected from the group consisting of triazole, benzotriazole and benzotriazole derivatives; and

wherein the silicon compound contained in the masking composition, is at least one compound selected from the group consisting of mercaptopropyltrimethoxysilane, methyltriethoxysilane, aminosilane, trimethylchlorosilane and vinyltriethoxysilane.

4,940,609

POLYMERIC CONDITIONER FOR PRETREATING NONMETALLIC SURFACES FOR CHEMICAL METALLIZATION

Chung-Ji Tschang, Bad Durkheim; Johannes P. Dix, Neuhofen; Ekhard Winkler, Mutterstadt; Guenther Gotzmann, Frankenthal; Klaus Glaser, Mutterstadt, and Rolf Fikentscher, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Dec. 22, 1988, Ser. No. 288,622
Int. Cl.[5] C23C *26/00*
U.S. Cl. 427—304 12 Claims

1. A process for the chemical metallization of the nonmetallic surface of a molding, which comprises the following steps:

(a) cleaning said surface;

(b) activating said surface with a metal colloid dispersed in an aqueous medium;

(c) stripping excess colloid from said surface; and

(d) chemically depositing a metal on said surface, and wherein, at any time prior to process step (b), said surface is treated with a conditioner which is one or more quaternary salts of a polycondensate of an amine in aqueous solution, wherein said amine is at least one member selected from the group consisting of di-(hydroxyalkyl)-amines and tri-(hydroxyalkyl)-amines, and wherein from 10 to 99% of the nitrogen atoms of said polycondensate are quaternized with a C4–C12-alkyl group or a benzyl group.

4,940,610

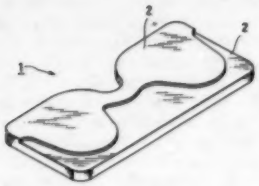
METHOD FOR PREVENTING LOOSENING OF A BOLT

Jun Sakai, and Takeshi Natsume, both of Saitama, Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan

Filed May 10, 1989, Ser. No. 349,704
Claims priority, application Japan, May 10, 1988, 63-111427
Int. Cl.[5] B05D *3/12*
U.S. Cl. 427—355 7 Claims

1. A method for preventing loosening of a bolt fastened to a

metallic member coated with an anticorrosive paint film, characterized by the step of thinning said anticorrosive paint film



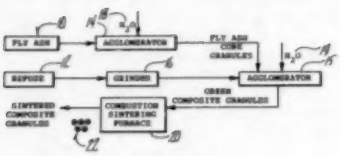
by applying an urging pressure on a bolt seat surface portion of said coated metallic member by means of a press rod.

4,940,611

HARDENED, ENVIRONMENTALLY DISPOSABLE COMPOSITE GRANULES OF COAL CLEANING REFUSE, COAL COMBUSTION WASTE, AND OTHER WASTES, AND METHOD PREPARING THE SAME

George Burnet, Ames, Iowa, and Ashok J. Gokhale, College Station, Tex., assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Dec. 20, 1988, Ser. No. 287,488
Int. Cl.[5] B32B 5/16
U.S. Cl. 428—2 18 Claims



1. A method for preparing hardened, environmentally disposable composite granules of coal cleaning refuse and coal combustion waste comprising:

forming roughly spherical granules of coal combustion waste; pulverizing coal cleaning refuse; binding a layer of pulverized coal cleaning refuse to the coal combustion waste granules;

combusting and sintering the combined coal combustion waste granules with the outer layer of pulverized coal cleaning refuse to form hardened, environmentally inert and disposable composite granules of coal cleaning refuse and coal combustion waste.

4,940,612

OXYGEN IMPERMEABLE LEAK FREE CONTAINER

Charles E. Gibbons; Gerald A. Marano; James M. Kittrell; Allan A. Whitlock; Robert L. Lanham, all of Mobile, and Donald Evans, South Mobile, all of Ala., assignors to International Paper Company, Tuxedo Park, N.Y.

Filed May 9, 1988, Ser. No. 191,987
The portion of the term of this patent subsequent to May 1, 2007, has been disclaimed.
Int. Cl.[5] B65D 5/56; B32B 27/10
U.S. Cl. 428—34.2 21 Claims

1. An oxygen barrier laminate structure for producing an oxygen impermeable leak free container comprising:

(a) a mechanically stable structural substrate having an inner and an outer surface;

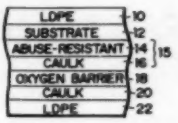
(b) an outer layer of a heat-sealable low density polyethylene polymer coated on said outer surface of said mechanically stable substrate;

(c) an inner layer of an abuse resistant polymer resin sandwiched together with a first caulking polymer resin coated on said inner surface of said mechanically stable structural substrate wherein said abuse resistant polymer contacts said substrate;

(d) an oxygen barrier layer placed onto the inner surface of said caulking polymer resin;

(e) a second layer of a caulking polymer resin coated onto the inner surface of said oxygen barrier material layer; and

(f) an inner product contact layer of low density polyethylene polymer coated on the inner surface of the second



caulking polymer resin layer, being heat-sealable, with the outer layer of low density polyethylene polymer of the laminate, on conventional extrusion equipment at temperatures ranging from 250° F. to 500° F. and wherein said first and second caulking polymer resins are selected from the group consisting of zinc salts of ethylene methacrylic acid copolymers, sodium salts of ethylene methacrylic acid copolymers, ethylene acrylic acid copolymers, ethylene methacrylic acid copolymers, ethylene vinyl acetate copolymers, and ethylene methacrylate copolymers.

4,940,613

PROTECTIVE COATINGS FOR GLASS AND CERAMIC VESSELS

Carlo M. Golino, Corning, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Feb. 27, 1989, Ser. No. 315,602
Int. Cl.[5] B32B 17/06, 17/10
U.S. Cl. 428—34.7 10 Claims

1. In a vessel composed of a material demonstrating a brittle fracture selected from the group consisting of glass, glass-ceramic, and ceramic, said vessel being coated with an organic polymer to reduce breakage and to contain fragments of said material upon fracture of said vessel and any liquid present in said vessel, the improvement wherein said organic polymer is bonded to said vessel at a small selected area only through a chemical primer which reacts with both said organic polymer and the material of said vessel at said selected area, the breadth of said selective area being sufficient such that the bond developed by said chemical primer between the material of said vessel and said organic polymer at said selected area is sufficiently strong to resist delamination and prevent entrapment of liquids in the interfacial region between said organic polymer coating and the surface of said vessel, but the breadth of said selected area not being so great as to become a significant area for shard penetration, wherein said selective area has a breadth of at least about 1% of the total height of said vessel.

4,940,614

TUBULAR CASING HAVING AN ADHESIVE TAPE IN THE DIRECTION OF ITS LONGITUDINAL AXIS

Erna Kastl, Niedernhausen; Marion Mathieu, Mainz-Kastel, and Anton Goerres, Eppstein-Vockenhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt-/Main, Fed. Rep. of Germany

Filed Apr. 10, 1989, Ser. No. 335,769
Claims priority, application Fed. Rep. of Germany, Apr. 13, 1988, 8804813
Int. Cl.[5] F16L 11/00; A22C 13/00
U.S. Cl. 428—348 20 Claims

1. A tubular food casing comprising a film bent to form a

tubing and an adhesive tape extending in the longitudinal direction of said tubing, said adhesive tape joining the edges of said film which extend in the longitudinal direction of said tubing such that a glued seam is formed between said adhesive tape and said edges, wherein said adhesive tape comprises a

plurality of incisions extending transversely from at least one longitudinal edge of said tape, wherein each of said incisions terminates at a point located within said glued seam, and wherein the bond strength between said adhesive tape and said film is greater than the tear resistance of said film.

4,940,615

TUBULAR FOODSTUFF CASING MADE OF CELLULOSE HYDRATE, IN PARTICULAR SYNTHETIC SAUSAGE CASING

Klaus-Dieter Hammer, Mainz, and Hermann Winter, Wiesbaden, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Feb. 21, 1989, Ser. No. 313,037

Claims priority, application Fed. Rep. of Germany, Mar. 4, 1988, 3807070

Int. Cl.[5] A22C *13/00*

U.S. Cl. 428—34.8 **25 Claims**

1. A tubular cellulose hydrate foodstuff casing comprising an external covering layer or an impregnation, said layer or impregnation comprising a fungicidal heterocyclic compound which comprises (a) a benzimidazole substituted in the 2-position, (b) an isothiazolone substituted at the nitrogen atom or at at least one carbon atom by an alkyl group or at least one carbon atom by a halogen, or (c) a substituted isothiazolone containing a fused aromatic ring.

4,940,616

MULTILAYERED CONTAINER AND METHOD FOR MAKING

Tadao Yatsu, and Nobuya Hinooka, both of Yamaguchi, Japan, assignors to Mitsui Petrochemical Industries, Tokyo, Japan

Continuation of Ser. No. 896,380, Aug. 14, 1986, abandoned, which is a division of Ser. No. 752,488, Jul. 8, 1985, Pat. No. 4,618,386, which is a continuation-in-part of Ser. No. 552,189, Nov. 15, 1983, abandoned. This application May 12, 1988, Ser. No. 195,416

Claims priority, application Japan, Nov. 15, 1982, 57-198898

Int. Cl.[5] B65D *23/00*; B32B *27/36*

U.S. Cl. 428—35.7 **6 Claims**

1. A three-layered container having a total thickness in the range of from 200 to 700 micrometers and an A/B/A structure comprising,

(A) two outer layers of polyethylene terephthalate each having a thickness in the range of from 100 to 600 micrometers, and

(B) an inner layer of a polyester having a thickness in the range of from 10 to 350 micrometers comprising the reaction product of a dicarboxylic acid component containing isophthalic acid in an amount exceeding 20 molar % and a glycol component containing ethylene glycol in an amount exceeding 80 molar %, said three-layered container being produced by the steps of extruding a multilayered tube from a multilayer extruding machine, bottom closing the extruded multilayered tube, and blow molding the closed tube, so that the closed tube is biaxially oriented.

4,940,617

MULTILAYER HOLLOW FIBER WOUND BODY

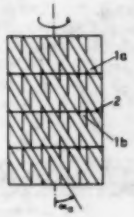
Ulrich Baurmeister, Wuppertal, Fed. Rep. of Germany, assignor to Akzo NV, Netherlands

Filed Mar. 10, 1988, Ser. No. 166,458

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1987, 3707584[U]; Feb. 8, 1988, 3803693[U]

Int. Cl.[5] B65H *81/00*

U.S. Cl. 428—36.3 **11 Claims**



1. A multilayer hollow fiber wound body, comprising at least two superposed hollow fiber mats in the form of a wound body comprising a plurality of hollow fiber plies;

said mats each comprising hollow fibers and transverse fibers, said hollow fibers being held by said transverse fibers and at least one portion of the hollow fibers being formed as helices or spirals on said wound body;

hollow fibers within each said mat being disposed at regular intervals and transverse fibers within each said mat being disposed at regular intervals, a ratio of the regular interval between adjacent transverse fibers to the regular interval between adjacent hollow fibers defining a parallelogram with said adjacent transverse fibers being in the range of 2 to 40;

hollow fibers of a ply of said wound body being disposed so as to cross hollow fibers of an adjacent successive ply of said wound body; and

none of said hollow fibers having a deflection site.

4,940,618

OPTICAL INFORMATION RECORDING MEDIUM

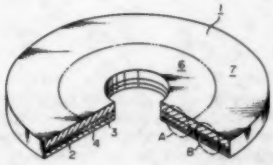
Emiko Hamada; Yuji Arai; Yuaki Shin, and Takashi Ishiguro, all of Tokyo, Japan, assignors to Taiyo Yuden Company, Ltd., Tokyo, Japan

Filed Apr. 14, 1989, Ser. No. 340,078

Claims priority, application Japan, Jul. 30, 1988, 63-191715; Jul. 30, 1988, 63-191716; Jan. 14, 1989, 1-7511

Int. Cl.[5] B32B *3/02*

U.S. Cl. 428—64 **8 Claims**



1. An optical information recording medium of the type wherein recorded data are reproduced by scanning them with a laser beam, which comprises a ROM region where optically

readable pits are already formed and an information recordable region where optically readable pits can be formed by irradiation with a writing laser beam, wherein the information recordable region comprises a light transmitting substrate having a deformable surface, a light absorptive layer overlaying the deformable surface, to absorb the writing laser beam, and a light reflective layer overlaying the light absorptive layer, said deformable surface being deformable by energy generated upon absorption of the writing laser beam by the light absorptive layer, to form optically readable pits.

4,940,619

RADIATION ABSORPTION DEVICE

W. Novis Smith, Jr., 412 S. Perth St., Philadelphia, Pa. 19147, and Michael G. Carroll, P.O. Box 681, Pittston, Pa. 18640

Continuation-in-part of Ser. No. 105,311, Oct. 5, 1987, abandoned. This application Aug. 25, 1989, Ser. No. 399,343

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—74 **8 Claims**

1. A wrapping covering for a marine vehicle or for wrapping about the front of a land vehicle for absorbing electromagnetic radiation, for preventing interference on a radio or electronic starter and as a protective cover against abrasion consisting essentially of:

A. a pair of flexible polymeric sheet material which are joined along the periphery by heat and/or pressure;

B. a flexible matrix between said sheets, said matrix consisting of a resinous material with carbon fibers randomly incorporated therein, said carbon fibers randomly distributed in said matrix in an amount of about 1–10 oz/yd^2, and attachment means associated with said covering for removably attaching said cover to the vehicle and being transported by the vehicle.

4,940,620

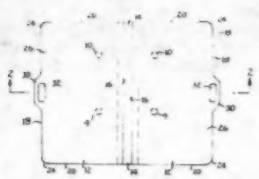
HIGHCHAIR FOOD COLLECTION

Vicki A. Silk, P.O. Box 18021, San Jose, Calif. 95158, and Regina Gray, 1245 Mountain Quail Circle, San Jose, Calif. 95120

Filed Oct. 23, 1989, Ser. No. 425,602

Int. Cl.[5] B32B *3/02, 3/10*

U.S. Cl. 428—81 **4 Claims**



1. A foldable mat adapted for placement on a floor underneath an infant's highchair to catch food items; said mat comprising two similarly dimensioned rectangular panels;

each panel having a flat uninterrupted upper face, a flat uninterrupted lower face, two longitudinal side edges, and two connecting lateral edges; said panels being arranged in side-by-side relation, with two of their longitudinal edges spaced a slight distance apart;

Means hingedly connecting said panels together for folding motion around an axis extending midway between said two longitudinal edges, so that the upper faces of the panels lie flat against one another in a storage mode; said hinge means comprising a continuous flexible strip of material extending the full length of the associated panels;

the upper face of each panel being a smooth non-porous surface devoid of crevices that could retain food or liquid when the surface is wiped with a damp cloth;

and similarly dimensioned handles located midway along the other two longitudinal edges of the panels; each handle being an integral extension of the associated panel; each handle having the same thickness as the associated panel, whereby the panels can be folded flat against one another without interference from the handles;

each panel being a rigid self-sustaining structure, whereby the defined mat can be placed upright on a kitchen sink with the two panels having lateral edges thereof resting on the sink surface so that the pad has a V-configuration in the top plan view, said panels being sufficiently rigid so that food and liquids can be wiped from the normally upper faces of the panels into the sink.

4,940,621

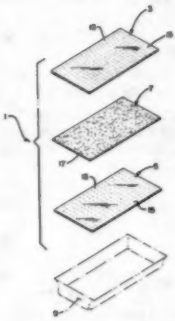
ABSORBENT PAD AND METHOD FOR CONSTRUCTING SAME

John C. Rhodes, Washington, Mo.; Ronald R. Aljoe, Lewisville, Tex., and Berne F. Ellers, Orkelljunga, Sweden, assignors to Clean-Pak, Inc., St. Louis, Mo. and Dry Forming Processes AB, Orkelljunga, Sweden

Filed Sep. 19, 1988, Ser. No. 246,155

Int. Cl.[5] B32B *3/10*

U.S. Cl. 428—137 **19 Claims**



1. An absorbent pad for meat and poultry products and the like including:

upper and lower plastic film layers, each having a series of through perforations of predetermined size extending throughout said layers;

a substantially uniform in thickness intermediate absorbent layer disposed between said upper and lower layers and having a plurality of juxtaposed and overlapping absorbent material fibers which are operatively secured to adjacent absorbent material fibers in structural supporting relationship and are also constructed to provide a plurality of spaced interstices extending throughout said absorbent layer;

a plurality of superabsorbent granular particles dispersed throughout the absorbent layer and being physically retained in place against movement within the absorbent layer, said particles being physically retained in place at random and spaced locations in said absorbent layer by said absorbent material fibers, said superabsorbent granular particles being capable of absorbing and suspending liquids therein while continuing to be held and physically retained in place by the absorbent material fibers of said

absorbent layer even after liquid is absorbed in said superabsorbent granular particles and absorbent material fibers; and

said upper and lower perforated plastic film layers being attached to one another at partially along opposite marginal edge portions thereof to retain said absorbent layer between said upper and lower layers;

whereby said absorbent material fibers and said superabsorbent granular particles absorb and suspend substantial quantities of liquid throughout the absorbent layer without reverse migration of liquid past the through perforations in said layers so as to maintain the absorbed and suspended liquid out of contact with the meat product.

4,940,622

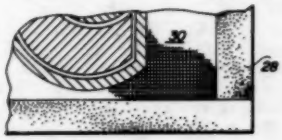
IMAGE BEARING SIGN AFFIXED TO A WINDOW

Edward J. Leavitt, Sr., 823 Fontana, Richardson, Tex. 75080, and Edward J. Leavitt, Jr., 535 E. Charleston, Phoenix, Ariz. 85022

Division of Ser. No. 854,405, Apr. 21, 1986, Pat. No. 4,883,556. This application Feb. 16, 1989, Ser. No. 301,836

Int. Cl.[5] B32B *3/10*

U.S. Cl. 428—137 **1 Claim**



1. An image bearing sign affixed to a vehicle window in accordance with the steps of:

(a) providing a perforated polymeric substrate of predetermined size;

(b) coating a surface of said perforated polymeric substrate with a photo coat emulsion;

(c) applying a mask to the coated polymeric substrate in selected areas to define image-bearing areas corresponding to the areas of the substrate immediately beneath said mask;

(d) exposing the polymeric substrate to light;

(e) removing the mask from the substrate;

(f) washing the polymeric substrate to remove the emulsion from the image areas;

(g) silkscreening at least predetermined portions of said image areas to impart images thereon; and

(h) adhesively securing the substrate to said window.

4,940,623

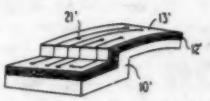
PRINTED CIRCUIT BOARD AND METHOD USING THERMAL SPRAY TECHNIQUES

Alexander A. Bosna, 135 Summit Rd., Malvern, Pa. 19355, and Louis M. Riccio, P.O. Box 81, DeVault, Pa. 19432

Filed Aug. 9, 1988, Ser. No. 230,401

Int. Cl.[5] B05B *5/00*; B05D *3/06*

U.S. Cl. 428—158 **5 Claims**



1. A method of making a printed circuit comprising the following steps:

(1) adhering one or more layers of hollow micron-sized spheres, beads or spaces to a surface of a substrate upon which said printed circuit is to be formed,

(2) rupturing at least the surfaces ones of said hollow micron-sized spheres, beads or spaces in said pattern by a laser beam under the control of a computer to produce a circuit path of nooks, crannies and undercuts formed by the remains of laser ruptured hollow micron-sized spheres, beads or spaces adhered to said surface in the pattern of said printed circuit,

(3) spraying electrically conductive metal on said ruptured hollow micron-sized spheres, beads or spaces to produce said printed circuit.

4,940,624

MASKING MEMBER

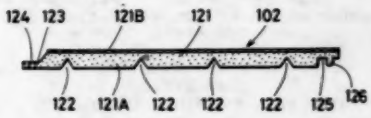
Seinosuke Horiki, and Reiji Makino, both of 213-5 Honowari, Minamishibata-cho, Tokai-shi, Aichi, Japan

Filed Nov. 3, 1989, Ser. No. 431,563

Claims priority, application Japan, Nov. 4, 1988, 63-144545[U]

Int. Cl.[5] B32B *1/00, 3/10, 3/30*

U.S. Cl. 428—159 **6 Claims**



1. A masking member consisting of an elastic sheet having a groove(s) for bending in a selected position(s) on one or both sides of said sheet.

4,940,625

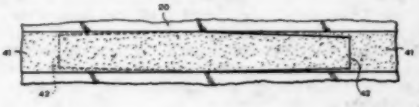
PROCESS FOR PRINTING CONTINUOUS STRIPE AND PRODUCT THEREOF

Robert S. Anderson, Adams Rd., P.O. Box 260, Summitsville, N.Y. 12781

Filed Feb. 16, 1989, Ser. No. 311,639

Int. Cl.[5] B32B *3/00*

U.S. Cl. 428—195 **12 Claims**



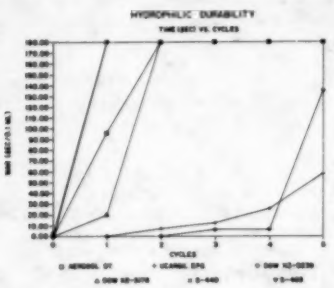
1. An axially elongate substrate having on a surface thereof an apparently continuous major stripe of constant width and straight edges and given length, said major stripe being defined by a plurality of successive slightly overlapping and generally longitudinally aligned minor stripes of substantially constant width, substantially straight edges, and shorter length, each said minor stripe having at least one inwardly tapered end overlapping the end of an adjacent minor stripe to provide the illusion of a continuous major stripe of constant width and straight edges by enhancing the apparent longitudinal alignment of said overlapping ends.

4,940,626

MELTBLOWN WIPER INCORPORATING A SILICONE SURFACTANT

Wayne T. Rhodes, III, Piedmont, and Normand M. Savaria, Greer, both of S.C., assignors to The James River Corporation, Va.

Filed May 26, 1988, Ser. No. 199,351
Int. Cl.[5] B32B 3/00
U.S. Cl. 428—198 13 Claims



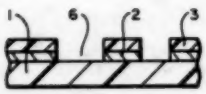
1. A wiper comprising:
a meltblown polypropylene substrate incorporating a functional organosilicone surfactant wetting agent capable of imparting durable hydrophilicity to said wiper.

4,940,627

THIN FILM ARTWORK COMPOUNDS

Wilfred C. Kittler, Jr., Thousand Oaks; Janos Czukor, Panorama City, and Darrell Stoddard, Malibu, all of Calif., assignors to Andus Corporation, Canoga Park, Calif.

Division of Ser. No. 10,873, Feb. 4, 1987, Pat. No. 4,911,745.
This application Jan. 24, 1990, Ser. No. 469,878
Int. Cl.[5] B32B 3/10; B44C 1/22; C23F 1/00
U.S. Cl. 428—203 6 Claims



1. A graphic artwork, comprising:
a substrate transparent to ultraviolet light;
a light blocking layer disposed on a surface of the substrate in a predetermined pattern, the light blocking layer comprising copper oxide and non-oxidized copper metal and being substantially opaque to ultraviolet light while remaining at least partially transparent to visible light.

2. The graphic artwork of claim 1, the light blocking layer having a thickness less than 3000 angstroms and a transmission no greater than 0.1% to light radiation having a wavelength between 300 and 400 angstroms.

4,940,628

ERASABLE SYSTEM INCLUDING MARKING SURFACE AND ERASABLE INK COMPOSITION

Nan J. Lin, Burlington, and Peter G. Hanley, Milford, both of Mass., assignors to The Gillette Company, Boston, Mass.

Continuation of Ser. No. 906,868, Sep. 15, 1986, abandoned. This application Oct. 24, 1988, Ser. No. 262,036
Int. Cl.[5] B32B 3/00; C08F 8/30; C09D 5/00
U.S. Cl. 428—207 20 Claims

1. An erasable system including a marking element and an erasable marking composition for applying markings to the marking element, said marking element comprising a plurality of superposed sheets bound in the form of a book, each sheet comprising a non-porous marking surface comprising a polymeric material carried by a substrate, said marking composition consisting essentially of an aqueous dispersion of a particulate, polymeric film-forming material, a colorant, and an amount of a polymeric shear-thinning material sufficient to provide an erasable marking composition having a shear-thinning index between about 0.01 to about 0.6, said marking composition having a viscosity of about 100 cPs or lower when measured at a shear rate of 300 reciprocal seconds and providing a coalesced residue on drying which is substantially water insoluble and which can be completely erased from the marking surface with an elastomeric eraser.

4,940,629

FIBER REINFORCED THERMOPLASTIC INTEGRAL SKIN FOAMS AND MANUFACTURE THEREOF

Heinz Weber, Gruenstadt; Gerhard Bleckmann, Lampertheim; Gerhard Dembek, Bad Duerkheim; Gerd Ehrmann, Deidesheim; Gerhard Heinz, Weisenheim, and Lothar Schlemmer, Maxdorf, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,143
Claims priority, application Fed. Rep. of Germany, May 5, 1988, 3815723
Int. Cl.[5] B32B 7/02, 3/26
U.S. Cl. 428—213 4 Claims

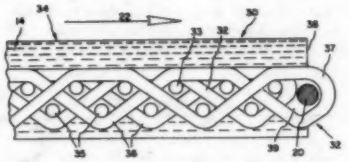
1. A fiber reinforced thermoplastic integral skin foam of density 50–500 kg/m^3 having a solid outer skin 0.05–1.5 mm in thickness, containing from 2 to 60 % by weight of reinforcing fibers in mat form having a median fiber length of not less than 50 mm.

4,940,630

BASE FABRIC STRUCTURES FOR SEAMED WET PRESS FELTS

Patrick H. Penven, Clinton, S.C., assignor to Astex Group, Inc., Charleston, S.C.

Continuation of Ser. No. 318,727, Mar. 3, 1989, Pat. No. 4,892,781, which is a division of Ser. No. 108,491, Oct. 14, 1987, Pat. No. 4,824,525. This application Nov. 13, 1989, Ser. No. 435,609
Int. Cl.[5] B32B 5/02
U.S. Cl. 428—234 3 Claims



1. A papermaker's wet press felt which is rendered endless by intermeshing seaming loops, extending from respective ends of a base fabric of said felt, and inserting a pintle in the resulting channel formed by the loops, said felt comprising:
(a) the base fabric being flat woven in a selected repeat pattern with N layers, where N is a positive integer, of crimped warp yarns oriented lengthwise in the loom and further oriented in the felt running direction during use on the papermaking machine;
(b) said crimped warp yarns being woven at least 30 N to 60 N yarns per inch;
(c) each of said seaming loops, at the respective ends of said felt, being a portion of a selected one of said crimped warp

yarns of said base fabrics which extends beyond the respective end of said woven base fabric and is retained in said base fabric by said selected repeat pattern, said seaming loops extending in the lengthwise or felt running direction when said loops are intermeshed at the seam; and

(d) at least one layer of batt material affixed to said base fabric.

4,940,631

CELLULAR CELLULOSIC WIPING MATERIAL

Claudine Colin, Rantigny, and Jean-Luc Wertz, Beauvais, both of France, assignors to Societe Anonyme: Spontex, France

Filed Jul. 28, 1988, Ser. No. 225,227
Claims priority, application France, Mar. 30, 1988, 88 04218
Int. Cl.[5] B32B *3/26, 7/04*
U.S. Cl. 428—309.9 16 Claims

1. A cellular cellulosic wiping material, comprising a cellular cellulosic substrate at least one side of which is coated with an expanded latex foam obtained from an aqueous latex composition having a viscosity of 2500 to 3500 mPa.s measured at 20° C. under 65% relative humidity, and having a foam density of 250 to 400 g/l.

4,940,632

FOAM LAMINATES WHICH INCLUDE ASTM E-84 CLASS 1 RATED FOAMS

William J. Nicola, Burgettstown, Pa., and Wolfgang W. Reichmann, Leverkusen, Fed. Rep. of Germany, assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Oct. 6, 1989, Ser. No. 418,429
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—318.4 1 Claim

1. A foam laminate comprising a polyurethane foam core sandwiched between two facing material, wherein said foam core has the following properties:

(i) a flamespread as determined by ASTM E-84 of 25 or less,

(ii) a smoke density as determined by ASTM E-84 of less than 450,

(iii) a dimensional stability measured as a % volume change as determined by ASTM D-2126,after 28 days (1) at −30° C. of no more than 1, (2) at 100° C. of no more than 8, and (3) at 70° C. and 100% relative humidity of no more than 12, and

(iv) a firmness of no more than 0.6 centimeters after 5 minutes, and wherein said foam core is produced by reacting:

(a) a polymethylene poly(phenyl isocyanate), a isocyanate group containing prepolymer based on a polymethylene poly(phenyl isocyanate), or mixtures thereof,

(b) from 37 to 43% by weight of one or more aromatic polyester polyols having hydroxyl functionalities of 2.4 or more and hydroxyl numbers of 350 or more, or a mixture of aromatic polyester polyols, with said mixture having an average hydroxyl functionality of 2.4 or more and an average hydroxyl number of 350 or more,

(c) from 31 to 39% by weight of one or more polyether polyols having hydroxyl functionalities of 4 or more and hydroxyl numbers of 340 or more,

(d) from 22 to 30% by weight of one or more flame retardants, and,

(e) one or more blowing agents, one or more catalysts, and one or more surfactants, said % by weight totalling 100%, wherein the amount of component (b) is greater than component (c), and wherein the isocyanate index is from about 100 to about 115.

4,940,633

METHOD OF BONDING METALS WITH A RADIO-OPAQUE ADHESIVE/SEALANT FOR VOID DETECTION AND PRODUCT MADE

Ralph D. Hermansen, 19136 Nashville St., Northridge, Calif. 91326; Thomas H. Sutherland, 16710 Orange Ave., No. 073, Paramount, Calif. 90723, and Roamer Predmore, 13007 Renfrew Cir., Fort Washington, Md. 20744

Filed May 26, 1989, Ser. No. 357,154
Int. Cl.[5] B05D *3/00*; B32B *31/24*
U.S. Cl. 428—324 14 Claims

1. In a method for bonding together and/or sealing metal structures with an adhesive layer comprising a polymer compound where the possibility exists that voids in the polymer compound may occur, wherein the improvement comprises incorporating a powder filler comprising a high atomic number metal having an atomic number of between 72 and 82 or compound thereof into said polymer compound, wherein the amount of said powder filler in said polymer compound is between about 5 volume percent to 50 volume percent, to provide a radio-opaque polymer compound which is more radio-opaque than the bonded and/or sealed metal structures to thereby allow inspection for voids in the radioopaque polymer compound by non-destructive high energy radiation inspection.

4,940,634

HIGH BARRIER LOW PROFILE FORMING WEB

Walter B. Mueller, Inman, and Henry G. Schirmer, Spartanburg, both of S.C., assignors to W. R. Grace & Co.-Conn., Duncan, S.C.

Filed Mar. 21, 1986, Ser. No. 842,530
Int. Cl.[5] B32B *1/02, 31/12, 31/30*
U.S. Cl. 428—349 17 Claims

1. A thermoplastic composite film useful in thermoforming operations comprising:

(a) a first oriented polymeric film oriented to substantially the same extent in both the longitudinal and transverse directions;

(b) a second polymeric film bonded over most of a major surface to the first film, and comprising an oxygen barrier layer sufficient to protect packaged food products; and

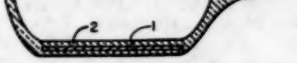
(c) wherein the first film has been oriented to a maximum orientation ratio of about 3.5:1 and the first polymeric film has been bonded to the second polymeric film after effecting biaxial orientation of the first polymeric film.

4,940,635

PROCESS TO ENCAPSULATE GRAPHITE INTO GLASS AND GLASS CERAMIC ARTICLES, AND ARTICLES MANUFACTURED BY THIS PROCESS

Andre Andrieu, Nemours; Jean-Pierre P. Davot, Avon, and Jean-Pierre A. M. Thibieroz, Samoreau, all of France, assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 23, 1988, Ser. No. 275,442
Claims priority, application France, Nov. 24, 1987, 87 16244
Int. Cl.[5] B32B *9/00*
U.S. Cl. 428—408 20 Claims



1. In a method for press forming a composite glass-ceramic article having a heat conducting, graphite insert fully encapsulated therewithin which comprises the steps:

(a) delivering a first charge of molten glass to a mold;

(b) pressing said first charge into an initially formed article while simultaneously pressing said heat conducting graphite insert within one surface thereof;

(c) depositing a second charge of molten glass upon said initially formed article;

(d) pressing said second charge of molten glass into a finished integral article incorporating said initially formed article and simultaneously fully encapsulating said insert therewithin; and then

(e) heat treating said glass article to convert it into a glass-ceramic article;

the improvement which comprises incorporating at least one gas getter metal selected from the group consisting of aluminum, chromium, niobium, tantalum, titanium, and zirconium with said insert in an amount at least sufficient to provide a coating on the entire surface of said insert having a thickness of at least 0.5 micrometers.

4,940,636

OPTICAL INTERFERENCE FILTER

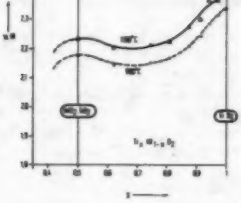
Lieselotte Brock; Gunter Frank, and Bruno Vitt, all of Aachen, Fed. Rep. of Germany, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 21, 1988, Ser. No. 223,463

Claims priority, application Fed. Rep. of Germany, Jul. 22, 1987, 3724216

Int. Cl.[5] B32B *17/06*

U.S. Cl. 428—426 **8 Claims**



1. An optical interference filter having an alternating sequence of first low-refractive index layers and second high-refractive index layers on a glass substrate, the first layers consisting essentially of amorphous SiO_2 and the second layers being crystalline layers and consisting essentially of TiO_2 and a second metal oxide, characterized in that the material of the second layers is a mixed oxide chosen from a group consisting of:

88–95 mole. % TiO_2 and 5–12 mole. % ZrO_2,

88–95 mole. % TiO_2 and 5–12 mole. % of an oxide selected from the group HfO_2, $TiO_2.ZrO_2$, $TiO_2.HfO_2$, $TiO_2.Nb_2O_5$, $TiO_2.Ta_2O_5$ and $Ta_2O_5.2TiO_2$ and mixtures or combinations of these materials, the crystal structure of the second layers corresponding to a crystal structure obtained in a heat treatment at a temperature between 700° and 1100° C.

4,940,637

DENTAL FOIL AND CROWN

Itzhak Shoher, 50 Shlomo Hamelech St., Tel Aviv, and Aharon Whiteman, 13 J. L. Perez St., Petach-Tikvah, both of Israel

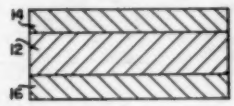
Continuation-in-part of Ser. No. 847,228, Apr. 2, 1986, Pat. No. 4,676,751, which is a continuation of Ser. No. 690,650, Jan. 11, 1985, abandoned. This application Dec. 31, 1986, Ser. No. 948,008

The portion of the term of this patent subsequent to Jun. 30, 2004, has been disclaimed.

Int. Cl.[5] B32B *15/04*; A61C *5/09*

U.S. Cl. 428—607 **4 Claims**

1. A metal foil for forming a dental coping in the construction of a dental restoration in which said dental coping has a veneering composition applied thereon following heat treatment of such coping, with said metal foil having one or more layers of a high fusing temperature precious metal consisting essentially of a gold and palladium based composition having a



high fusing temperature above the temperature of said heat treatment, and having a low fusing temperature layer of gold or gold alloy on each side of said high fusing temperature layer.

4,940,638

PLATED STEEL SHEET FOR A CAN

Takeshi Adaniya; Yoshinori Yomura; Naoyuki Ooniwa; Yoshihiko Yasue; Hiroshi Kagechika; Tadahiko Mishima, and Hiroshi Ishikawa, all of Tokyo, Japan, assignors to NKK Corporation, Tokyo, Japan

Filed Sep. 16, 1988, Ser. No. 245,754

Claims priority, application Japan, Sep. 18, 1987, 62-233975

Int. Cl.[5] B32B *15/01*

U.S. Cl. 428—648 **12 Claims**

1. Plated steel sheet for a can comprising:

a steel sheet;

an Al plated film 0.005 to 5 μm thick on one surface of the steel sheet; and

a plated film of 0.005 to 5 μm thick on the other surface said steel sheet, the plated film comprising a metal selected from the group consisting of Ti, Zn, Ni, Co, Cr, Mo and Sn.

4,940,639

ZN-NI ALLOY-PLATED STEEL SHEET WITH IMPROVED IMPACT ADHESION

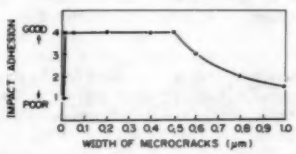
Kazuhide Ohshima, Wakayama, and Nobukazu Suzuki, Ibaragi, both of Japan, assignors to Sumitomo Metal Industries, Ltd., Osaka, Japan

Filed Jul. 6, 1989, Ser. No. 376,022

Claims priority, application Japan, Jul. 7, 1988, 63-169352; Sep. 1, 1988, 63-219090

Int. Cl.[5] B32B *15/01, 15/18*

U.S. Cl. 428—659 **5 Claims**



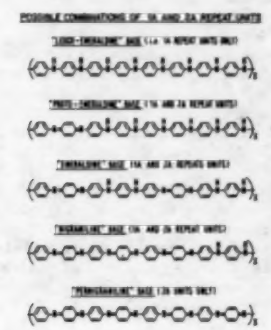
1. A Zn-Ni alloy electroplated steel sheet exhibiting improved corrosion resistance as well as improved adhesion upon impact and resistance to powdering, comprising a steel sheet; a thin Zn-Ni alloy electroplated underlayer on at least one side of the steel sheet in which microcracks having a width of 0.01–0.5 μm and covering 10–60% of the surface area of the electroplated layer are randomly oriented; and a Zn-Ni alloy electroplated toplayer.

4,940,640

HIGH CAPACITY POLYANILINE ELECTRODES

Alan G. MacDiarmid, Drexel Hill, Pa., assignor to University of Pennsylvania, Philadelphia, Pa.

Continuation of Ser. No. 757,884, Jul. 23, 1985, abandoned. This application Sep. 6, 1988, Ser. No. 241,796
Int. Cl.[5] H01M 4/60
U.S. Cl. 429—213 11 Claims



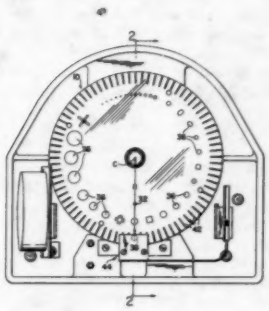
1. An electrochemical cell comprising anode active means, cathode active means and aprotic electrolyte at least one of said anode and cathode means consisting essentially of polyaniline species wherein each nitrogen of the polymer chain is associated with one, but only one, hydrogen atom.

4,940,641

APERTURE DISC AND METHOD OF MAKING THE SAME

Robert J. Pavone, South Windsor; Bruce L. Davidson, East Hartford, and Henry F. Berdat, Manchester, all of Conn., assignors to The Gerber Scientific Instrument Company, South Windsor, Conn.

Division of Ser. No. 157,285, Feb. 17, 1988, Pat. No. 4,841,316. This application Mar. 8, 1989, Ser. No. 320,418
Int. Cl.[5] G03F 1/00
U.S. Cl. 430—5 16 Claims



1. An aperture disc for use in a photohead having a light source exposing upon a photosensitive surface various images and having a light sensor indicating the position of said disc relative to said photohead, wherein said aperture disc comprises:

a thin flat sheet of transparent material having a generally opaque surface adjointed thereto and defining the aperture disc shape;

first marks formed on said aperture disc oriented in a first arcuate path around a center, each of said first marks of said first path selectively allowing radiant energy generated by a light source to pass through the otherwise opaque surface of said aperture disc onto a photosensitive surface;

second marks formed on said aperture disc oriented in a second arcuate path concentric with said first pattern, each of said second marks of said second pattern allowing radiant energy emitted by a light sensor to pass through the otherwise opaque surface of said aperture disc onto a detector formed with the light sensor;

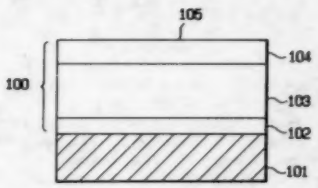
each of the first marks of the first path being in radial alignment with a second mark of the second path whereby said sensor identifies the presence of one of said first marks defining said first path when the corresponding radially aligned second mark defining said second path passes across said light sensor and allows radiant energy to activate said detector.

4,940,642

ELECTROPHOTOGRAPHIC LIGHT RECEIVING MEMBER HAVING POLYCRYSTALLINE SILICON CHARGE INJECTION INHIBITION LAYER PREPARED BY CHEMICAL REACTION OF EXCITED PRECURSORS AND A-SI:C:H SURFACE LAYER

Shigeru Shirai; Keishi Saito; Takayoshi Arai; Minoru Kato, and Yasushi Fujioka, all of Shiga, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation-in-part of Ser. No. 21,342, Mar. 3, 1987, abandoned. This application Jan. 26, 1989, Ser. No. 302,114
Claims priority, application Japan, Mar. 5, 1986, 61-48018
Int. Cl.[5] G03G 5/14, 5/082
U.S. Cl. 430—65 35 Claims



1. A light receiving member for use in electrophotography comprising: a substrate for electrophotography and a light receiving layer disposed on said substrate, said light receiving layer comprising a charge injection inhibition layer of 0.01 to 10 pm in thickness, a photoconductive layer of 1 to 100 μm in thickness; and a surface layer of 0.003 to 30 μm in thickness being disposed in this order from the side of said substrate; said charge injection inhibition layer comprising a polycrystalline material containing silicon atoms as the main constituent and 30 5×10^4 atomic ppm of a conductivity controlling element selected from the group consisting of Group III and Group V elements of the Periodic Table; said charge injection inhibition layer being formed by chemically reacting (i) a precursor (A) generated from a silicon- and halogen-containing substance (a) by subjecting said compound (a) to the action of an activation energy; (ii) an active species (B) generated from a substance (b) selected from the group consisting of H_2, HF, HCl, HBr and HI by subjecting said substance (b) to the action of an activation energy, and (iii) a gaseous substance (c) for imparting said conductivity controlling element in the absence of a plasma in a film deposition space while adjusting the volume ratio of said precursor (A) to said active species (B) to be in the range from 20:1 to 1:20 based on flow ratio; said photoconductive layer comprising an amorphous material containing silicon atoms as the main constituent and at least one kind of atom selected from hydrogen atoms and halogen atoms in a total amount of 1 to 40 atomic % and said surface layer having a free surface and comprising an amorphous material of the formula: A-

$(Si_xC_{1-x})_yH_{1-y}$, wherein x is 0.1 to 0.99999 and y is 0.6 to 0.999.

4,940,643

RECORDING SYSTEM HAVING A COATING DEVICE FOR COATING RECORDING MEDIUM OR PHOTOSENSITIVE MEDIUM WITH DEVELOPER MATERIAL REACTING WITH COLOR PRECURSOR

Jun Sakai; Shunichi Higashiyama, both of Nagoya; Koji Suzuki, Kasugai, and Mitsuru Ohta, Nagoya, all of Japan, assignors to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Continuation-in-part of Ser. No. 159,736, Feb. 24, 1988. This application Dec. 27, 1988, Ser. No. 289,673

Claims priority, application Japan, Dec. 29, 1988, 62-332488

Int. Cl.[5] G03G *9/10*

U.S. Cl. 430—108 **11 Claims**

1. A toner for forming a developer medium which is capable of reacting with a chromogenic material to produce a visible dye image, comprising:

developer particles each including a developer material capable of reacting with said chromogenic material; and

thermoplastic resin particles having a smaller grain size than said developer particles, each of said developer particles carrying a multiplicity of said thermoplastic resin particles deposited on a surface thereof.

4,940,644

TONER FOR DEVELOPMENT OF ELECTROSTATIC IMAGES AND IMAGE FORMING METHOD BY USE THEREOF

Akitoshi Matsubara; Satoru Ikeuchi; Kunio Akimoto, and Yoshio Takizawa, all of Hachioji, Japan, assignors to Konishiroku Photo Industry Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 6,549, Mar. 31, 1987, abandoned. This application Dec. 22, 1988, Ser. No. 291,416

Claims priority, application Japan, Mar. 15, 1985, 60-50340; Aug. 28, 1985, 60-187348; Aug. 28, 1985, 60-187350

Int. Cl.[5] G03G *9/10*

U.S. Cl. 430—109 **19 Claims**

1. In a toner for development of electrostatic images using hot roller development of the type comprising a resin and a colorant, the improvement comprising

said resin being mainly constituted of a copolymer comprising a crystalline polymer block and an amorphous polymer block chemically bound to each other and wherein

said crystalline polymer block has a melting point of 50° to 120° C.; has a number average molecular weight of 1,000 to 20,000; has a weight average molecular weight of 2,000 to 100,000; comprises a crystalline polyalkylene polyester; and is contained in said copolymer in an amount of 5 to 50 parts by weight based on 100 parts by weight of said copolymer;

said amorphous polymer block has a glass transition point of 50° to 100° C.; has a number average molecular weight of 1,000 to 50,000; and comprises an amorphous aromatic polyester;

said copolymer has a number average molecular weight of 1,000 to 30,000; has a weight average molecular weight of 5,000 to 300,000; and has a dynamic moduli of 2×10^3 to 1×10^5 dye/cm^2 at least one point from 70° to 140° C.; and

said toner further comprising an inorganic fine powder in an amount of 0.01 to 5% by weight based on the total weight of the toner.

4,940,645

IMAGING MATERIAL EMPLOYING PHOTOSENSITIVE MICROCAPSULES CONTAINING TERTIARY AMINES AS COINITIATORS

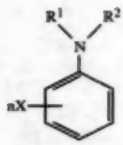
Paul D. Davis, Centerville; Gary F. Hillenbrand, Chillicothe, and Paul C. Adair, Springboro, all of Ohio, assignors to The Mead Corporation, Dayton, Ohio

Continuation of Ser. No. 755,400, Jul. 16, 1985, abandoned. This application Jan. 19, 1989, Ser. No. 300,168

Int. Cl.[5] G03C *1/68, 1/72*

U.S. Cl. 430—138 **24 Claims**

1. A photosensitive microcapsule having improved film speed comprising, as the internal phase, a photosensitive composition including a free radical addition polymerizable material, and a photoinitiator system, wherein said photoinitiator system includes an absorber, a coinitiator and an autoxidizer, said absorber, said coinitiator and said autoxidizer being different, said coinitiator being a compound which is more efficient in yielding free radicals by interacting with said absorber than said autoxidizer and said autoxidizer being more efficient in yielding free radicals by interacting with oxygen or oxygen radicals than said co-initiator, the quantum efficiency of said photosensitive composition in reacting with oxygen being substantially greater than 1, wherein said absorber is an aryl ketone, said co-initiator is an N,N-dialkylaniline represented by the formula



(I)

wherein R^1 and R^2 are the same or different and represent an alkyl group having 1 to 6 carbon atoms or a benzyl group; and x a substituent having a Hammett's constant in the range of −0.9 to 0.7 and said autoxidizer is a thiol.

4,940,646

POLYVINYL ACETAL WITH HYDROXY ALIPHATIC ACETAL GROUPS USEFUL IN PHOTOSENSITIVE NEGATIVE WORKING COMPOSITIONS

Georg Pawlowski, Wiesbaden, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Dec. 21, 1987, Ser. No. 135,316

Claims priority, application Fed. Rep. of Germany, Dec. 23, 1986, 3644162

Int. Cl.[5] G03C *1/60, 1/68*

U.S. Cl. 430—175 **9 Claims**

1. A photosensitive mixture comprising:

(A) a negative-working light-hardenable substance selected from the group consisting of:

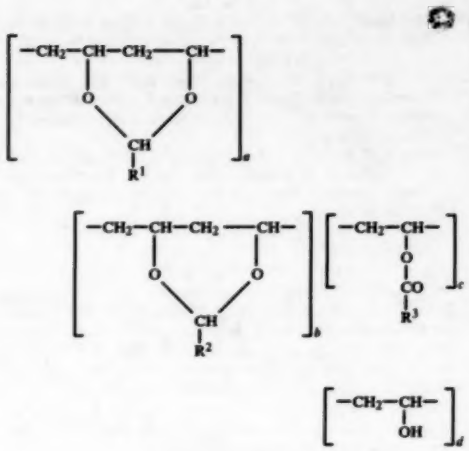
(1) a diazonium salt polycondensation product containing diazonium salt units and non-photosensitive units derived from compounds capable of condensation and selected from the group consisting of aromatic amines, phenols, phenol ethers, aromatic thioethers, aromatic hydrocarbons, aromatic heterocyclic compounds and organic acid amides, and

(2) a mixture of olefinically unsaturated, radically polymerizable compound and a photoinitiator for radical polymerization

in admixture with

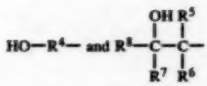
(B) a polyvinyl acetal having a hydroxyl number of from 150 to 600,

wherein the light-hardenable substance and the polyvinyl acetal are present in amounts sufficient to produce an image when exposed to actinic radiation and developed wherein the polyvinyl acetal is a compound of the formula



wherein

R^1 is a radical selected from the group consisting of



R^2 is a hydrogen atom, a substituted or unsubstituted alkyl radical containing 1 to 6 carbon atoms, or a substituted or unsubstituted aryl radical,

R^3 is an alkyl radical containing 1 to 4 carbon atoms,

R^4 is a substituted or unsubstituted alkylene group containing 1 to 6 carbon atoms,

R^5 and R^6 are identical or different and denote hydrogen atoms, alkyl radicals containing 1 to 6 carbon atoms, alkoxy radicals containing 1 to 4 carbon atoms, or hydroxyalkyl radicals containing 1 to 3 carbon atoms or hydroxyl groups,

R^7 is a hydrogen atom or an alkyl radical containing 1 to 6 carbon atoms,

R^8 is a hydrogen atom, an alkyl, hydroxyalkyl or alkoxyalkyl radical containing 1 to 6 carbon atoms or a substituted or unsubstituted aryl radical containing 6 to 10 carbon atoms,

a is a number from 0.05 to 0.8,

b is a number from 0.2 to 0.6,

c is a number from 0.01 to 0.15,

d is a number from 0.04 to 0.2, and the sum of a+b+c+d=1.

4,940,647

PHOTOPOLYMERIZABLE COMPOSITIONS A LEUCO DYE AND A LEUCO DYE STABILIZER

Hans-Dieter Frommeld, Wiesbaden, and Hartmut Wiezer, Eppstein, both of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 6, 1988, Ser. No. 254,240

Claims priority, application Fed. Rep. of Germany, Oct. 16, 1987, 3735088

Int. Cl.[5] G03C *1/76*

U.S. Cl. 430—271 **27 Claims**

1. A photopolymerizable composition comprising:

(a) a polymeric binder,

(b) a compound having at least one terminal ethylenic double bond and a boiling point above about 100° C. at standard pressure and being capable of forming a polymer by free-radical initiated polymerization;

(c) a photoinitiator,

(d) a leuco dye, and

(e) a leuco dye stabilizer comprising a compound having at least one epoxy group.

13. A photopolymerizable recording material comprising a support and a photopolymerizable layer that comprises:

(a) a polymeric binder;

(b) a compound having at least one terminal ethylenic double bond and a boiling point above about 100° C. at standard pressure and being capable of forming a polymer by free-radical initiated polymerization;

(c) a photoinitiator,

(d) a leuco dye, and

(e) a leuco dye stabilizer comprising a compound having at least one epoxy group.

4,940,648

INCREASED SENSITIVITY PHOTOINITIATION COMPOSITIONS

Margaret W. Geiger, Neshanic Station, N.J., assignor to Hoechst Celanese Corporation, Somerville, N.J.

Filed Feb. 12, 1988, Ser. No. 156,354

Int. Cl.[5] G03C *1/70, 1/78, 1/94;* B01J *37/34*

U.S. Cl. 430—272 **24 Claims**

13. A photographic element which comprises a substrate and a photopolymerizable composition coated on said substrate, which photopolymerizable composition comprises a photopolymerizable monomer or oligomer containing at least two ethenically unsturated double bonds and a photopolymerization initiator composition which comprises a 9-phenyl acridine, or a phenazine compound and at least one peroxide or perester compound.

16. The photographic element of claim 13 wherein said substrate comprises a material selected from the group consisting of polyester, silicon, gallium arsenide, aluminum and its alloys.

4,940,649

PHOTOPOLYMERIZABLE RECORDING MATERIALS AND PHOTORESIST LAYERS AND LITHOGRAPHIC PRINTING PLATES BASED THEREON

Reinhard Aldag, Ludwigshafen; Peter Neumann, Wiesloch; Andreas Boettcher, Leimen; Thomas Bluemel, Erpolzheim; Friedrich Seitz, Friedelsheim, and Friedrich-Wilhelm Raulfs, Mannheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed May 17, 1988, Ser. No. 196,079

Claims priority, application Fed. Rep. of Germany, May 21, 1987, 3717036

Int. Cl.[5] G03C *1/70*

U.S. Cl. 430—281 **11 Claims**

1. A photopolymerizable recording material composed of one or more photopolymerizable olefinically unsaturated organic compounds, optionally a polymeric binder, one or more photopolymerization initiators, a color-forming system which on irradiation with actinic light causes an increase in the color intensity of the recording material, a sensitizer and optionally further additives or auxiliary substances, wherein the sensitizer comprises: one or more compounds of the formula (I) or (II)

4,940,650

PREPARATION OF RECORDING LAYERS AND THEIR USE FOR THE PRODUCTION OF FLEXOGRAPHIC PRINTING PLATES

Karl-Rudolf Kurtz, Heidelberg; Horst Koch, Gruenstadt, and Guenther Schulz, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

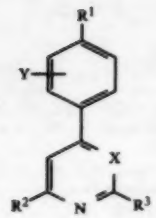
Division of Ser. No. 90,749, Aug. 28, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 331,392

Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 3630474

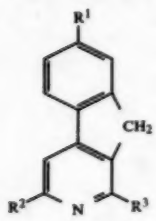
Int. Cl.[5] G03C *1/70, 1/71*

U.S. Cl. 430—283 7 Claims

(I)



(II)



where

X is CH or N,

Y is hydrogen, C_1- to C_{12}-alkyl, C_1- to C_{12}-alkoxy, or halogen,

R^1 is C_1- to C_{12}-alkyl, C_1- to C_{12}-alkoxy, trifluoromethyl, phenyl, or NR^4R^5 where R^4 and R^5 are identical to or different from each other and each is:

a C_1- to C_6-alkyl; an allyl, phen-alkyl having 1 to 4 carbon atoms in the alkyl group; a phenyl unsubstituted or suubstituted by a C_1- to C_6-alkyl-, a C_1 to C_6-alkoxy- or a halogen; a C_1 to C_{12} alkyl substituted by OH-, CN-, halogen-, -O-CO-alkyl having 1 to 6 carbon atoms in the alkyl group, or -CO-O-alkyl having 1 to 6 carbon atoms in the alkyl group; or an oxaalkyl having 3 to 12 carbon atoms and 1 to 5 oxygen atoms, or

R^4 and R^5 together form a heterocyclic, saturated or unsaturated ring system, and

R^2 and R^3 are identical to or different from each other and each is C_1- to C_{12}-alkyl; C_1- to C_{12}-alkoxy; hydroxyalkyl having 1 to 4 carbon atoms in the alkyl group; an oxaalkyl having 2 to 12 carbon atoms and 1 to 5 oxygen atoms; phen-alkyl having 1 to 4 carbon atoms in the alkyl group; phenyl; naphthyl; or an aryl or hetaryl that are each substituted by:

a C_1- to C_4-alkyl; C_1- to C_4-alkoxy; phenyl; trifluoromethyl; trialkylsilyl; CN; a C_1 to C_{12} alkyl substitutued by -O-CO-alkyl having 1 to 12 carbon atoms in the alkyl group, -CO-O-alkyl having 1 to 12 carbon atoms in the alkyl group, OH-, CN-, halogen, -O-CO-alkyl having 1 to 6 carbon atoms in the alkyl group, -CO-O-alkyl having 1 to 6 carbon atoms in the alkyl group; an oxaalkyl or 2 to 12 carbon atoms and 1 to 6 oxygen atoms; a halogen; or NR^6R^7, where R^6 and R^7 are identical to or different from each other and each is:

a C_1- to C_8-alkyl; an allyl; a phen-alkyl having 1 to 4 carbon atoms in the alkyl group, a phenyl unsubstituted or substituted by a C_1- to C_6-alkyl-, C_1- to C_6-alkoxy-, or halogen; a C_1 to C_{12} alkyl substituted by OH-, CN-, halogen-, -O-CO-C_1-alkyl having 1 to 6 carbon atoms in the alkyl group, or -CO-O-alkyl having 1 to 6 carbon atoms in the alkyl group; or an oxaalkyl or 3 to 12 carbon atoms and 1 to 5 oxygen atoms; or

R^6 and R^7 together are a substituted or unsubstituted heterocyclic saturated or unsaturated ring system,

with the proviso that the maximum of the long-wave absorption band of these compounds is below 420 nm.

1. A photosensitive recording element for the production of ozone resistant flexographic printing plates comprising a dimensionally stable base and a photosensitive flexible recording layer which is prepared by applying a photosensitive mixture to a dimensionally stable base and subjecting the mixture on the dimensionally stable base to calendering and/or lamination, said photosensitive mixture consisting essentially of

(A) one or more block copolymers containing at least one thermoplastic non-elastomeric polymer block and at least one elastomeric diene polymer block,

(B) a mixture of

(B1) from 5 to 20% by weight, based on the photosensitive mixture, of one or more photopolymerizable organic compounds which are compatible with (A) and contain one or more olefinic double bonds, and

(B2) from 1 to 15% by weight, based on the photosensitive mixture, of one or more monoolefinically unsaturated photopolymerizable organic compounds which are compatible with (A) and whose homopolymers have glass transition temperatures which are below room temperature, said organic compounds being selected from the group consisting of amides of acrylic acid with an alkylamine having 4 to 16 carbon atoms in the alkyl radical and vinyl alkyl ethers having 4 to 18 carbon atoms in the alkyl radical,

(C) from 0.1 to 10% by weight, based on the photosensitive mixture, of one or more photoinitiators, and

(D) from 0 to 27% by weight, based on the photosensitive mixture, of conventional assistants and additives;

the photosensitive flexible recording layer produced therefrom being isotropic or having a very low degree of anisotropy as expressed by an anisotropy factor AF of 1.5, AF being defined as the ratio of the moduli of elasticity at 100% elongation of strips measuring 2×15 cm which have been punched from the photosensitive flexible recording layer after its production, on the one hand along the flow direction of the photosensitive mixture employed and on the other hand crosswise to the flow direction then have been exposed uniformly to actinic light.

4,940,651

METHOD FOR PATTERNING CATIONIC CURABLE PHOTORESIST

Lawrence M. Brown, Endwell, N.Y.; Jeffrey D. Gelorme, Plainville, Conn.; Joseph P. Kuczynski, Apalachin, and William H. Lawrence, Greene, both of N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Dec. 30, 1988, Ser. No. 292,173

Int. Cl.[5] G03C *5/00*

U.S. Cl. 430—325 14 Claims

1. A method for patterning a photoresist which comprises:

a. providing on a substrate an uncured film consisting essentially of a cationic curable photoresist and an onium slat photoinitiator;

b. imagewise exposing said photoresist to a laser beam operated at wavelengths of about 333 nanometers to about 365 nanometers in a pattern to thereby cure portions of said photoresist by cationic polymerization; and

c. developing said photoresist by contacting with a solvent

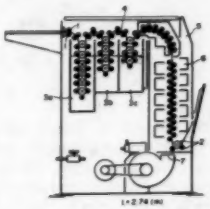
to thereby remove the portions of the photoresist not exposed to said laser beam.

4,940,652

METHOD OF PROCESSING SILVER HALIDE PHOTOGRAPHIC MATERIAL WHICH PREVENTS SEPIA DETERIORATION

Satoru Nagasaki, Hino, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Feb. 10, 1989, Ser. No. 309,511
Claims priority, application Japan, Feb. 20, 1988, 63-3772119
Int. Cl.[5] G03C 5/24
U.S. Cl. 430—403 **20 Claims**



1. A method of processing a silver halide photographic material having a total silver amount of no more than 7.0 g/m^2 on a support and containing at least one of a dye having a maximum absorption wavelength between 520–560 nm and a dye having a maximum absorption wavelength, between 570–700 nm in an amount effective to increase the transmission optical density of the unexposed area after processing by no more than 0.03,comprising the step of processing said silver halide photographic material with a roller-transport type automatic developer under the conditions that satisfy the following relationships:

$$50 \leqq l^{0.75} \times T \leqq 124$$

$$0.7 \leqq l \leqq 3.1$$

wherein l is the length in meters of the delivery path in the developer, and T is the time in seconds taken for the silver halide photographic material to pass through the path.

4,940,653

MULTILAYERED COLOR PHOTOGRAPHIC MATERIAL HAVING AN ALKALI SOLUBLE INTERLAYER

Prem Lalvani; Diethart Lademann, both of Leverkusen; Hans Buschmann, Cologne; Heinz Reif, Cologne, and Walther Cohnen, Cologne, all of Fed. Rep. of Germany, assignors to Agfa-Gevaert Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Continuation of Ser. No. 95,905, Sep. 14, 1987, abandoned. This application Sep. 22, 1989, Ser. No. 410,950
Int. Cl.[5] G03C 1/46
U.S. Cl. 430—502 **5 Claims**

1. A silver halide color photographic element comprising a support, on the support at least one red-sensitive silver halide emulsion layer containing at least one non-diffusible cyan coupler, at least one green-sensitive silver halide emulsion layer containing at least one non-diffusible magenta coupler, at least one blue-sensitive silver halide emulsion layer containing at least one yellow coupler and

at least one interlayer which is not the layer of the photographic element furthermost from the support

said interlayer containing polymer particles soluble in alkali in a quantity of from 20 to 200 mg/m^2 of the photographic element and having an average particle diameter of from 0.5 to 3.0 μm.

4,940,654

SOLID PARTICLE DISPERSION FILTER DYES FOR PHOTOGRAPHIC COMPOSITIONS

Donald R. Diehl, and Ronda E. Factor, both of Rochester, N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation-in-part of Ser. No. 137,495, Dec. 23, 1987, abandoned. This application Jun. 30, 1989, Ser. No. 373,749
Int. Cl.[5] G03C 1/84
U.S. Cl. 430—522 **10 Claims**

1. A photographic element comprising a support having thereon a radiation-sensitive silver halide emulsion layer and a hydrophilic filter dye layer comprising a hydrophilic binder and an amount effective as a photographic filter dye of a dispersion of solid particles having a mean diameter of from about 0.01 to 10 mm, said particles consisting essentially of a filter dye having the formula:

$$[D\text{-}(A)_y]\text{-}X_n$$

where

D is a chromophoric light-absorbing moiety, which, when y is 0, comprises an aromatic ring free of carboxy substituents,

A is an aromatic ring, free of carboxy substituents, bonded directly or indirectly to D,

X is a substituent, other than carboxy, having an ionizable proton, either on A or on an aromatic ring portion of D, having a pKa of about 4 to 11 in a 50/50 mixture (volume basis) of ethanol and water,

y is 0 to 4,

n is 1 to 7, and

the compound has a log partition coefficient of from about 0 to 6 when the compound is in unionized form.

4,940,655

PHOTOGRAPHIC ANTISTATIC ELEMENT HAVING A BACKING LAYER WITH IMPROVED ADHESION AND ANTISTATIC PROPERTIES

Kurt Gundlach, Webster, N.Y., assignor to E. I. du Pont de Nemours and Company, Wilmington, Del.

Filed May 5, 1988, Ser. No. 190,545
Int. Cl.[5] G03C 1/76
U.S. Cl. 430—523 **8 Claims**

1. A photosensitive film element comprising a support, at least one gelatino silver halide emulsion composition coated on one side of said support, an antistatic layer coated on the opposite side of said support, and coated over said antistatic layer an auxiliary layer consisting essentially of an aqueous dispersion of gelatin, at least one gelatin cross-linking agent, at least one dispersing agent and an adhesion promoting amount of an aqueous dispersion of a polymerized vinyl compound, with the proviso that said adhesion promoting vinyl compound is added to said auxiliary layer dispersion after the pH is adjusted to 5 to 7.

4,940,656

PHOTOGRAPHIC SUPPORT

Shigehisa Tamagawa, and Tetsuro Fuchizawa, both of Shizuoka, Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 171,138, Mar. 16, 1988, Pat. No. 4,859,577, which is a continuation of Ser. No. 41,666, Apr. 20, 1987, abandoned, which is a continuation of Ser. No. 894,476, Aug. 5, 1986, abandoned, which is a continuation of Ser. No. 727,892, Apr. 26, 1985, abandoned, which is a continuation of Ser. No. 469,970, Feb. 25, 1983, abandoned. This application Jun. 19, 1989, Ser. No. 367,806

Claims priority, application Japan, Feb. 26, 1982, 57-30355

The portion of the term of this patent subsequent to Aug. 22, 2006, has been disclaimed.

Int. Cl.[5] G03C 1/96

U.S. Cl. 430—538 1 Claim

1. A photographic support comprising a photographic layer sensitive to light and a polyolefin-coated paper layer comprising a paper sheet which contains an alkylketene dimer mixture in an amount of 0.2–2.0% by weight of the absolutely dried pulp constituting the paper sheet and is coated with a polyolefin on both surfaces; wherein said alkylketene dimer mixture consists essentially alkyl chains having 14 carbon atoms or less than 14 carbon atoms in the chain, an alkyl chain having 16 carbon atoms in the chain, and at least one alkyl chain having 18 carbon atoms in the chain and alkyl chains of 20 carbon atoms or more than 20 carbon atoms in the chain under the condition satisfying the following equation

$$\frac{\frac{1}{3} \times [C_{16}] + [C_{18}] + 10 \times [C_{20} \text{ and more}]}{[C_{14} \text{ and less}]} \geq 1$$

in which

[C_{14} and less] means the amount of alkyl chains having carbon atoms of 14 and less;

[C_{16}] means the amount of an alkyl chain having 16 carbon atoms;

[C_{18}] means the amount of an alkyl chain having 18 carbon atoms; and

[C_{20} and more] means the amount of alkyl chains having carbon atoms of 20 and more,

the alkyl chain amounts being represented by percent in number of the total alkyl chain amount of the alkylketene dimer composition mixture wherein [C_{18}] and [C_{20} and more] are each 0.

4,940,657

PHOTOGRAPHIC SPECTRAL SENSITIZING DYE

Akira Tanaka; Hidetoshi Miura, and Masao Koga, all of Nagaokakyo, Japan, assignors to Mitsubishi Paper Mills Limited, Tokyo, Japan

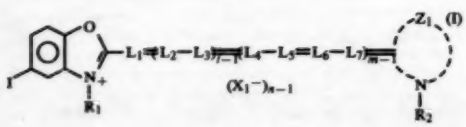
Filed Jan. 19, 1989, Ser. No. 298,975

Claims priority, application Japan, Jan. 21, 1988, 63-12360

Int. Cl.[5] G03C 1/19, 1/20, 1/14, 1/22

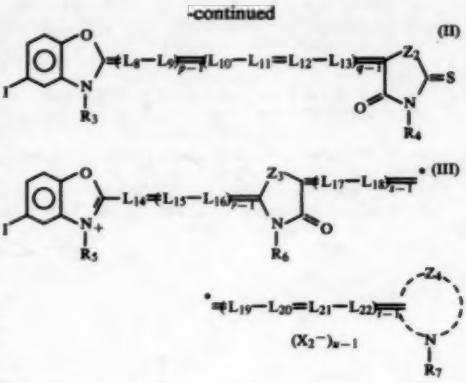
U.S. Cl. 430—578 3 Claims

1. A silver halide photographic emulsion which comprises a silver halide and a spectral sensitizing dye consisting essentially of at least one of the following compounds:



(I)

-continued



(II)

(III)

wherein R_1, R_2, R_3, R_5 or R_7 each represents an alkyl group, an aralkyl group or an alkenyl group, R_4 and R_6 each represents an alkyl group, aralkyl group, alkenyl group or aryl group, L_1–L_{22} each represents a methine group, Z_1–Z_4 each represents a group of atoms necessary to form a 5- or 6-membered nitrogen-containing heterocyclic ring, X_1^- and X_2^- each represents an acid anion and l, m, n, p, q, r, s, t and u each represents an integer of 1 or 2.

4,940,658

ASSAY FOR SULFHYDRYL AMINO ACIDS AND METHODS FOR DETECTING AND DISTINGUISHING COBALAMIN AND FOLIC ACID DEFICENCY

Robert H. Allen, Englewood; Sally P. Stabler, Denver, both of Colo., and John Lindenbaum, New York, N.Y., assignors to University Patents, Inc., Westport, Conn.

Filed Nov. 20, 1986, Ser. No. 933,553

Int. Cl.[5] C12Q 1/00; G01N 24/00; A61K 31/68, 31/495

U.S. Cl. 435—4 34 Claims

18. A method for detecting a deficiency of cobalamin, folate, or both in warm-blooded animals and distinguishing therebetween comprising assaying body fluids for the presence of elevated levels of total homocysteine and methylmalonic acid, wherein normal levels of total homocysteine indicate no cobalamin or folic acid deficiency, elevated levels of total homocysteine and methylmalonic acid indicate cobalamin deficiency, and elevated levels of total homocysteine combined with normal levels of methylmalonic acid indicate folic acid deficiency.

4,940,659

SCREENING EXTRA-CELLULAR BODY FLUIDS FOR SUPEROXIDE DISMUTASE (SOD-1) FOR DETERMINING FETAL TRISOMY 21 DOWN SYNDROME

Richard E. Warrington; Abbas A. Khan, both of Houston, Tex., and Carl R. Merril, Rockville, Md., assignors to Monoclonetics International, Inc., Houston, Tex.

Filed Feb. 20, 1987, Ser. No. 17,152

Int. Cl.[5] G01N 33/53; C12Q 1/44, 1/26

U.S. Cl. 435—7 4 Claims

1. A method for detecting a likelihood of Trisomy 21 Down's Syndrome in a fetus comprising:

assaying to determine the concentration of cuprozinc superoxide dismutase (SOD-1) in an extra-cellular body fluid of a mother in at least the twelfth week of pregnancy;

assaying samples of control maternal extra-cellular body fluid of the same type and substantially the same gestational age as the body fluid specimen from the mother, some of said samples being known to be positive and some negative for fetal Trisomy 21 Down's syndrome, to deter-

mine a threshold minimum concentration of SOD-1, which is the concentration at which the number of false positive or false negative samples is minimized, or the number of false positive and false negative samples is minimized;

determining whether said concentration of SOD-1 in the body fluid specimen of the mother is above the threshold minimum concentration, which is indicative of a likelihood of fetal Trisomy 21 Down's syndrome.

4,940,660

COLOR DEVELOPING METHOD IN CLINICAL EXAMINATIONS

Hidematsu Hirai, Mitaka; Toshiro Hanada, Kawagoe; Kazuhiko Yamanishi, Tokyo, and Hideko Nohara, Asaka, all of Japan, assignors to Wako Pure Chemical Industries, Osaka, Japan

Filed Oct. 2, 1986, Ser. No. 914,834

Claims priority, application Japan, Nov. 25, 1985, 60-264142; Jun. 17, 1986, 61-141057

Int. Cl.[5] **G01N** *33/53;* **C12Q** *1/28, 1/26*

U.S. Cl. 435—7 **12 Claims**

1. A process for the determination of the amount of hydrogen peroxide or peroxidase activity in a clinical sample, which comprises:

adding to a clinical sample a reagent composition comprising (a) a reduced form coenzyme selected from the group consisting of NADH and NADPH, (b) a reagent selected from the group consisting of amines, phenols and naphthols, (c) a tetrazolium salt as a color producing reagent to be reduced and (d) peroxidase or an aqueous solution of hydrogen peroxide,

measuring a change in absorbance and

calculating the amount of hydrogen peroxide or peroxidase activity from the change in absorbance.

4,940,661

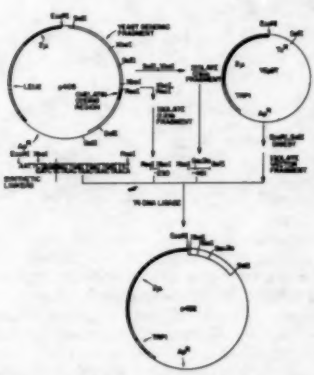
METALLOTHIONEIN TRANSCRIPTION CONTROL SEQUENCES AND USE THEREOF

Tina M. Etcheverry, Berkeley, and Ronald A. Hitzeman, Pacifica, both of Calif., assignors to Genentech, Inc., South San Francisco, Calif.

Continuation of Ser. No. 611,235, May 17, 1984, abandoned. This application Sep. 29, 1987, Ser. No. 102,189

Int. Cl.[5] **C12P** *21/00, 21/02, 19/34*

U.S. Cl. 435—69.1 **14 Claims**



1. A vector comprising a selection gene, yeast origin of replication or autonomously replicating sequence and DNA encoding a eukaryotic polypeptide other than yeast chelatin, said DNA encoding a eukaryotic polypeptide that is under the control of (a) a yeast chelatin promoter, (b) a yeast chelatin transcription control sequence, or (c) a metal ion regulatory region of the yeast chelatin transcription control sequence which is free of the yeast chelatin promoter, whereby the vector is replicable in a suitable host.

4,940,662

LOW-MOLECULAR WEIGHT PEPTIDE MIXTURE AND METHOD OF PRODUCING SAME

Ken-ichi Yamazaki, Kawagoe; Shoji Takao, Higashikurume, and Koji Yamamoto, Kawasaki, all of Japan, assignors to Terumo Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 471,793, Mar. 3, 1983, abandoned. This application Nov. 1, 1985, Ser. No. 794,322

Claims priority, application Japan, Mar. 6, 1982, 57-35485

Int. Cl.[5] **C12P** *21/00, 21/06;* **C12N** *9/48;* **C07K** *3/12*

U.S. Cl. 435—68.1 **4 Claims**

1. A method of producing a low-molecular weight peptide mixture comprising a major proportion of dipeptides and tripeptides produced from a starting natural protein to which at least two desired amino acids are incorporated, said at least two desired amino acids being the ones whose contents in the starting protein are low, whereby said dipeptides and tripeptides have a modified amino acid composition different from an amino acid composition of said starting protein, comprising the steps of

dissolving at least one alkaline protease selected from the group consisting of papain, bromelain and ficin, in a buffer solution adjusted to an optimum pH for the protease up to 10,

adding at least one starting protein in a buffer solution having an alkaline pH up to 10 and a concentration of 10 to 60% by weight of the protein material and thoroughly mixing the solution,

adding at least two ethyl esters of amino acids, said amino acids being selected from the group consisting of L-lysine, L-methionine, L-valine, L-isoleucine and L-leucine,

the pH of said buffer solution being optimum for the incorporation of said amino acid in said starting protein in the presence of said alkaline protease in a plastein reaction,

reacting said ester of at least two amino acids with said starting protein in a plastein reaction in the mixed solution having an alkaline pH whereby said at least two amino acids are covalently incorporated into said starting protein to produce a plastein reaction solution containing a modified protein,

subjecting said plastein reaction solution to concentration using a reverse osmosis membrane having an NaCl rejection of not higher than 40% to thereby purify said reaction solution by removing inorganic salts, unreacted amino acid and amino acid ester, and other low-molecular weight impurities from the reaction solution, and forming an aqueous solution containing 3 to 20% by weight of said modified protein,

hydrolyzing said modified protein in said purified aqueous solution by simultaneously or successively adding at least two acidic proteases having different specificity than said at least one alkaline protease, said acidic proteases being selected from the group consisting of pepsin, molsin and orientase, to said aqueous solution containing 3 to 20% by weight of said modified protein at an acidic pH, and maintaining a reaction temperature of 25° to 60° C. for from 8 to 72 hours to produce a low-molecular weight peptide mixture having an amino acid content which has different proportions of amino acids than does said starting protein, and

separating from the hydrolyzed solution said low-molecular weight peptide mixture which comprises a major proportion of dipeptide and tripeptides and containing not more than 15% by weight of free amino acids and not more than 20% by weight of a high-molecular weight fraction of compounds having a molecular weight of not lower than 700 and removable by gel filtration.

4,940,663

FERMENTATION PROCESS FOR THE PRODUCTION OF XANTHANE

Bruno Eyssautier, Carentan, France, assignor to SANOFI, Societe Anonyme, Paris, France

Filed Jun. 22, 1988, Ser. No. 209,932
Claims priority, application France, Jun. 22, 1987, 87 08727
Int. Cl.[5] C12P *19/06*; C12N *1/20*
U.S. Cl. 435—104 6 Claims

1. A fermentation process for the production of xanthane which comprises the step of fermenting carbohydrates with bacteria of the genus Xanthomonas in a fermentation medium containing a nitrogen source, wherein said source of nitrogen consists of a partially hydrolyzed gelatin with a molecular weight of less than 5000, whereby the resulting xanthane has elevated viscosity per unit weight.

4,940,664

STABILIZATION OF CARRIER-BOUND ENZYMES BY TREATMENT WITH A BIFUNCTIONAL CROSSLINKING AGENT AND A POLYAMINE

Ingo Mücke, Barsinghausen, Fed. Rep. of Germany, assignor to Kali-Chemie Aktiengesellschaft, Hanover, Fed. Rep. of Germany

Filed May 23, 1988, Ser. No. 197,436
Claims priority, application Fed. Rep. of Germany, Jun. 10, 1987, 3719324
Int. Cl.[5] C12N *11/14, 11/00*
U.S. Cl. 435—176 21 Claims

1. A method for producing carrier-bound enzymes having improved stability comprising the steps of:

(a) providing a granular carrier which has functional groups capable of forming covalent bonds and which is coated with an enzyme to produce a carrier-bound enzyme, and

(b) contacting said carrier-bound enzyme in any sequence with an amount of 5 to 250 mg per 1 gram of dry carrier-bound enzyme of a bifunctional cross-linking agent contained in a 0.1 to 10% (w/v) aqueous solution of the cross-linking agent and with an amount of 3 to 240 mg per 1 gram of dry carrier-bound enzyme of a polyamine contained in a 0.1 to 20% (w/v) aqueous solution of said polyamine,

whereby a granular carrier-bound enzyme is produced.

4,940,665

METHOD FOR GRANULATION OF ENZYME

Hitoshi Iijima, and Kunio Nishimura, both of Tokyo, Japan, assignors to Showa Denko K. K., Tokyo, Japan

PCT No. PCT/JP86/00661, § 371 Date Aug. 4, 1987, § 102(e) Date Aug. 4, 1987, PCT Pub. No. WO87/04184, PCT Pub. Date Jul. 16, 1987
PCT Filed Dec. 26, 1986, Ser. No. 103,550
Claims priority, application Japan, Dec. 27, 1985, 60-293167
Int. Cl.[5] C12N *9/98*
U.S. Cl. 435—187 5 Claims

1. A method for the granulation of a raw enzyme powder, comprising the steps of:

adding to a raw enzyme powder in a substantially dry state at least one wax selected from the group consisting of (1) polyethylene glycol having a melting point in the range of 40°–100° C. and an average molecular weight in the range of 3,000–10,000 and (2) polyoxyethylene-polyoxypropylene block copolymers having a melting point within the range of 40°–100° C. and an average molecular weight in the range of 7,000–24,000, in an amount in the range of 10–35% by weight based on the amount of said raw enzyme powder to obtain a mixture;

agitating said mixture at a temperature 5°–20° C. higher than the melting point of said at least one wax to obtain a granular material;

cooling said granulated material; and

adding to said cooled granular material at least one molten binder selected from the group consisting of (i) polyethylene glycol having a melting point of not less than 35° C. and not higher than the softening point of said wax and (ii) polyoxyethylene-polyoxypropylene block copolymer having a melting point of not less than 35° C. and not higher than said softening point of said wax, while tumbling said cooled granular material, thereby overcoating the granules of said material with said at least one binder.

4,940,666

PROCESS AND DEFINED MEDIUM FOR GROWTH OF HUMAN EPIDERMAL KERATINOCYTE CELLS

Stephen T. Boyce, and Richard G. Ham, both of Boulder, Colo., assignors to University Patents, Inc., Westport, Conn.

Continuation of Ser. No. 514,178, Jul. 15, 1983, Pat. No. 4,673,649. This application Dec. 9, 1986, Ser. No. 939,579
The portion of the term of this patent subsequent to Jun. 16, 2004, has been disclaimed.
Int. Cl.[5] C12N *5/00, 5/02*
U.S. Cl. 435—240.2 3 Claims

1. A population of human epidermal cells growing in a transferrin-free medium comprising:

complete MCDB153;

epidermal growth factor at a concentration of 1.0 ng/ml to 25.0 ng/ml; and

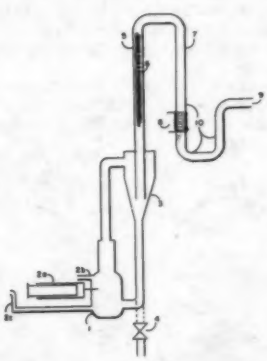
insulin at a concentration of 0.5 μg/ml to

4,940,667

APPARATUS FOR MONITORING THE QUALITY OF WATER

Arthur J. Goldstein, Weston, and Edgardo J. Parsi, Lexington, both of Mass., assignors to Ionics, Incorporated, Watertown, Mass.

Filed Dec. 28, 1987, Ser. No. 138,757
Int. Cl.[5] G01N *1/18*
U.S. Cl. 436—157 15 Claims



10. A process for monitoring volatile organic compounds in water comprising gently boiling at least part of a portion of said water into a reforming and/or oxidizing zone at substantially atomospheric pressure having a temperature in the range of from about 450° to about 1000° C., whereby reformable and/or oxidizable volatile organic compounds in said water are reformed and/or oxidized at least in part into second compounds volatile in said temperature range which second compounds are at least partially soluble in water and at least partially ionizable therein, collecting and condensing at least part of the water vapor from said reforming and/or oxidizing zone into condensed liquid water and measuring the electrical impedance of said condensed liquid water.

11. In an apparatus adapted to remove at least in part organics from water having in combination therewith an instrument

for monitoring volatile organic compounds in effluent water from said apparatus, said compounds reformable and/or oxidizable at temperatures in the range of from about 450° C. to about 1000° C. in the presence of water vapor and/or air and/or oxygen at substantially atmospheric pressure, said instrument comprising a reforming and/or oxidizing zone, means for controlled, nucleated boiling of at least part of a portion of said effluent water into said zone, electric heating means for maintaining the temperature of said zone in the range of from about 450° to about 1000° C., means for collecting and condensing water vapor from said zone to condensed liquid water and means for measuring the electrical impedance of at least a portion of said condensed liquid water.

4,940,668

METHOD FOR INCREASING AGGLUTINATION OF GROUPS OF CELLS TO PRODUCE IMPROVED CELL LAYER INTERFACE IN CENTRIFUGED BLOOD SAMPLE

Stephen C. Wardlaw, Branford; Robert A. Levine, Guilford, both of Conn.; Rodolfo R. Rodriguez, Randolph, N.J., and Michael R. Loken, Los Altos, Calif., assignors to Becton Dickinson and Company, Parsippany, N.J.

Continuation of Ser. No. 794,127, Nov. 1, 1985, Pat. No. 4,695,553. This application Sep. 18, 1987, Ser. No. 98,370

The portion of the term of this patent subsequent to Sep. 22, 2004, has been disclaimed.

Int. Cl.[5] **G01N** *1/00*

U.S. Cl. 436—174 **1 Claim**

1. A method of removing unwanted blood cell types from an assay area in a sample, said method comprising the steps of: agglutinating said unwanted blood cell types into clumps by adding an effective amount of an antibody to the sample which selectively causes increased agglutination of the unwanted blood cell types; and displacing said clumps out of said assay area of the sample.

4,940,669

SAC INCLUDING A DETECTABLE METAL MARKER AND USE THEREOF IN AN ASSAY

Daniel B. Wagner, Raleigh, and Glenn P. Vonk, Fuquay-Varina, both of N.C., assignors to Becton Dickinson and Company, Franklin Lakes, N.J.

Filed May 15, 1987, Ser. No. 49,971

Int. Cl.[5] **G01N** *33/566, 33/543, 33/544, 33/532*

U.S. Cl. 436—501 **17 Claims**

1. A composition, comprising:

a mixture of an aqueous solution and a liposome, said liposome having encapsulated therein a solution of a detectable metal complexed with a chelating agent, said detectable metal being one which is fluorescent when complexed with an activator, said aqueous solution including a metal corresponding to the metal encapsulated within the liposome in a concentration sufficient to maintain a concentration of said metal encapsulated in the liposome of at least 5 millimolar.

4,940,670

METHOD FOR COMPOUNDING AND TESTING PATIENT SPECIFIC MONOCLONAL ANTIBODIES AND MONOCLONAL ANTIBODY FRAGMENTS FOR IN VIVO USE

Buck A. Rhodes, 1104 Stanford Dr., NE., Albuquerque, N. Mex. 87106

Continuation-in-part of Ser. No. 821,999, Jan. 24, 1986. This application Apr. 9, 1986, Ser. No. 849,741

Int. Cl.[5] **A61K** *39/395;* **G01N** *33/574, 33/577*

U.S. Cl. 436—548 **14 Claims**

1. A method to select, formulate and compound a variable formula patient specific monoclonal antibody-based drug for use in in vivo cancer detection or therapy for a specific patient, comprising the following steps:

(a) preselecting a panel of a plurality of monoclonal antibody components, the monoclonal antibody components comprising members selected from the group consisting of whole monoclonal antibodies and monoclonal antibody fragments, the monoclonal antibody components being predetermined to be specific to tumor associated antigens of a cancer type to be detected or treated;

(b) obtaining at least one first solid tumor specimen, from the specific patient, of the cancer type to be detected or treated;

(c) dividing the first solid tumor specimen into a number of aliquots corresponding to the number of monoclonal antibody components in the preselected panel;

(d) subjecting each monoclonal antibody component in the preselected panel to a different aliquot of the specific patient's first solid tumor specimen and allowing the preselected panel of monoclonal antibody components to bind to tumor associated antigens present in the specific patient's first solid tumor specimen;

(e) determining which, if any, of the monoclonal antibody components in the preselected panel bind to tumor associated antigens present in the specific patient's first solid tumor specimen; and

(f) choosing more than one monoclonal antibody component, if the chosen monoclonal antibody components are determined in step (e) to bind to tumor associated antigens present in the specific patient's first solid tumor specimen, for use in formulating and compounding a variable formula monoclonal antibody-based drug for use in in vito cancer detection or therapy for the specific patient.

4,940,671

HIGH VOLTAGE COMPLEMENTARY NPN/PNP PROCESS

J. Barry Small, Los Altos, and Matthew S. Buynoski, Palo Alto, both of Calif., assignors to National Semiconductor Corporation, Santa Clara, Calif.

Filed Apr. 18, 1986, Ser. No. 853,530

Int. Cl.[5] **H01L** *21/265*

U.S. Cl. 437—31 **7 Claims**

1. A process for making a monolithic silicon, planar, PN-junction-isolated integrated circuit that contains high performance PNP transistors along with conventionally fabricated NPN transistors, said process including the steps combined with conventional processing comprising:

starting with a wafer of a first conductivity type and having a masking oxide thereon;

etching said oxide photolithographically to create holes in said oxide where PNP transistors are to be located;

applying a first dopant to said wafer wherein said first dopant is capable of doping said substrate to the opposite conductivity type;

diffusing said first dopant into said substrate to a first depth and simultaneously regrowing said oxide;

etching said regrown oxide photolithographically to create holes therein where said PNP transistors are to be located and where an isolation region is to be located;

applying a second dopant to said wafer wherein said second dopant is capable of overcoming said first dopant and of doping said substrate to said first conductivity type;

stripping any oxide from said wafer;

growing an epitaxial layer on said oxide-free wafer, said epitaxial layer having said opposite conductivity type and a resistivity selected to optimize said NPN transistor collectors;

forming a masking oxide on said epitaxial layer;

etching said formed masking oxide photolithographically to create holes therein where said PNP transistors and said isolation region are to be located;

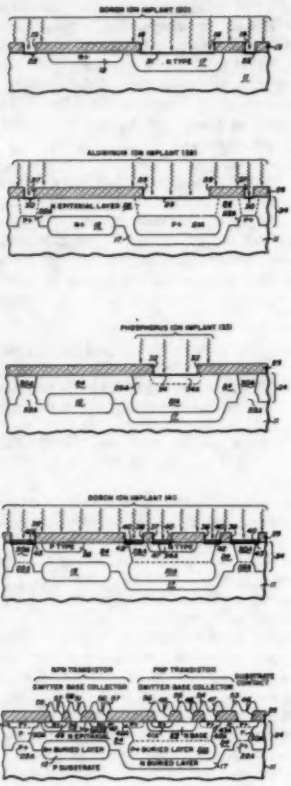
applying a third dopant to said wafer wherein said third dopant is capable of doping said epitaxial layer to said first conductivity type and controlling said third dopant to optimize said PNP transistor collectors;

diffusing said third dopant into said epitaxial layer to an extent where it contacts said second dopant which diffused away from said substrate and into said epitaxial layer and simultaneously regrowing said oxide;

etching said regrown oxide photolithographically to create holes therein where PNP transistor bases are to be located;

applying a fourth dopant to said wafer wherein said fourth dopant is capable of producing said opposite conductivity and is controlled to optimize said PNP transistor bases;

diffusing said fourth dopant to extend into said epitaxial layer to an extent designed to create said PNP transistor bases and simultaneously reforming said oxide;



etching said reformed oxide photolithographically to create holes therein where said PNP transistor emitters are to be located;

applying a fifth dopant to said wafer, said fifth dopant being capable of doping said epitaxial layer to said first conductivity type and controlling said fifth dopant level to optimize said PNP transistor emitters;

diffusing said fifth dopant to a desired depth that is less than that of said fourth dopant and simultaneously reforming said oxide;

etching said reformed oxide photolithographically to create holes therein where PNP transistor contacts are to be applied; and

forming PNP transistor contacts inside said holes in said oxide.

4,940,672

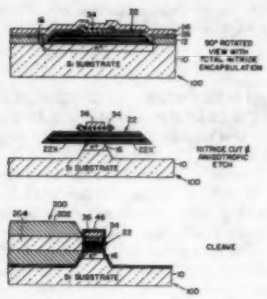
METHOD OF MAKING MONOLITHIC INTEGRATED III-V TYPE LASER DEVICES AND SILICON DEVICES ON SILICON

Paul M. Zavracky, Norwood, Mass., assignor to Kopin Corporation, Taunton, Mass.

Filed Mar. 17, 1989, Ser. No. 325,242

Int. Cl.[5] H01L *21/20, 21/203*

U.S. Cl. 437—132 **27 Claims**



8. A method of fabricating compound semiconductor devices of III–V or II–VI material and semiconductor devices of silicon on a common substrate comprising the steps of:

(a) forming Si electronic devices on selected areas of said substrate;

(b) forming a mask layer over the Si devices and the selected regions;

(c) forming openings through said mask layer to expose said selected regions;

(d) forming layers of said compound semi-conductor over at least the exposed selected regions which layers are single crystalline and form optoelectronic compound semiconductor devices with a lasing layer;

(e) forming contact metallization on said devices;

(f) removing regions of silicon adjacent and underlying portions of the compound semiconductor devices leaving the compound semiconductor devices isolated from silicon on lateral sides with two cantilevered beam sections of compound semiconductor devices extending in opposite directions; and

(g) separating the cantilevered sections from the compound semiconductor devices to provide end facets for the compound semiconductor devices.

4,940,673

PN JUNCTION PASSIVATION USING METHYLATED SILYLOXY GROUPS

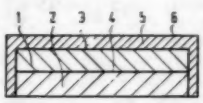
Johannes J. Ponjee; Fredericus J. Touwslager, and Ivo G. J. Camps, all of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 26, 1988, Ser. No. 249,612

Claims priority, application Netherlands, Oct. 2, 1987, 8702352

Int. Cl.[5] H01L *21/00, 21/02, 21/312, 21/314*

U.S. Cl. 437—225 **9 Claims**



1. A method of minimizing leakage current on a PN junction

present in a semiconductor device the surface of which is provided, at least at the location of the PN junction, with a silicon oxide layer, comprising forming methyl-substituted silyloxy groups on the surface of said layer by exposing said silicon oxide layer with a solution capable of forming such groups and in which solution an amine is present in which two alkyl groups are directly attached to the amino nitrogen.

4,940,674

HIGH STRENGTH, HAZE-FREE, TRANSPARENT GLASS-CERAMICS

George H. Beall, Big Flats; Paul S. Danielson, Corning, and Robert M. Morena, Caton, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Nov. 13, 1989, Ser. No. 434,188
Int. Cl.[5] C03C *3/22, 3/04*
U.S. Cl. 501—4 **8 Claims**

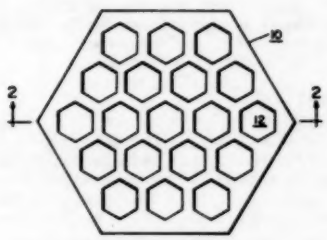
1. Transparent glass-ceramic articles which display essentially no haze, which contain about 15–30% by volume of an aluminoborosilicate glass and β-quartz solid solution as essentially the sole crystal phase, and which exhibit moduli of rupture in the vicinity of 10,000 psi consisting essentially, expressed in terms of weight percent on the oxide basis, of 3–6% Li_2O, 17–23% Al_2O_3, 1–4% B_2O_3, 60–70% SiO_2, 3–6% TiO_2 and/or ZrO_2, 25–500 ppm Cr_2O_3, and 1–5 mole percent of a glass modifying oxide selected from the group consisting of 0–3% K_2O and 0.5–2.5% SrO and/or BaO with a molar ratio Al_2O_3:Li_2O>1.

4,940,675

METHOD FOR MAKING LOW-EXPANSION GLASS ARTICLE OF COMPLEX SHAPE

Julie A. Bohlayer, Horseheads; Gordon F. Foster, Campbell, and Robert D. Shoup, Corning, all of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Filed Jun. 17, 1988, Ser. No. 207,968
Int. Cl.[5] C03C *1/00, 3/00*
U.S. Cl. 501—12 **21 Claims**



1. A process for providing a glass article of complex shape which comprises the steps of:

casting a silicate solution into a mold;

gelling the solution in the mold to provide a self-supporting wet gelled shape having the configuration of the mold;

machining the wet gelled shape to remove gel material therefrom, thus to provide a machined gel having a shape corresponding to that of that of the glass article; and

drying and consolidating the machined gel while maintaining the shape thereof to provide the glass article.

4,940,676

CERAMIC COMPOSITIONS AND METHODS EMPLOYING SAME

James G. Evans, Boerne, Tex., assignor to Board of Regents, The University of Texas System, Austin, Tex.

Continuation of Ser. No. 51,055, May 15, 1987, abandoned. This application Jun. 16, 1988, Ser. No. 207,909
Int. Cl.[5] A61C *13/00*; C03C *8/00*
U.S. Cl. 501—16 **13 Claims**

1. A method for preparing a ceramic composition capable of being fabricated into a ceramic object by subsequent firing, the method comprising the steps of:

(a) selecting a ceramic material wherein the ceramic material is a porcelain;

(b) mixing said material with a light-curing resin in proportions that will provide a ceramic resin mixture that is capable of being molded or formed into a desired shape prior to curing the resin and firing the cured ceramic resin mixture to provide the ceramic object;

(c) molding the ceramic resin mixture to a desired shape;

(d) light curing the resin to harden the molded mixture; and

(e) heating the hardened ceramic mixture sufficiently to fuse the ceramic material.

4,940,677

ZINC-CONTAINING PHOSPHATE GLASSES

George H. Beall, Big Flats, and Candace J. Quinn, Corning, both of N.Y., assignors to Corning Incorporated, Corning, N.Y.

Continuation-in-part of Ser. No. 258,675, Oct. 17, 1988, abandoned. This application Dec. 26, 1989, Ser. No. 456,550
Int. Cl.[5] C03C *3/16, 3/17, 3/19, 3/247*
U.S. Cl. 501—45 **8 Claims**

1. A glass exhibiting a transition temperature below 450° C., a working temperature below 500° C., and excellent resistance to attack by water and mild aqueous alkaline solutions, said glass consisting essentially, expressed in terms of mole percent on the oxide basis, of at least 65% total of 23–55% ZnO, 28–40% P_2O_5, and 10–35% R_2O, wherein R_2O consists of at least two alkali metal oxides in the indicated proportions selected from the group consisting of 0–25% Li_2O, 0–25% Na_2O, and 0–25% K_2O, and up to 35% total of optional ingredients in the indicated proportions selected from the group consisting of 0–6% Al_2O_3, 0–8% B_2O_3, 0–8% $Al_2O_3+B_2O_3$, 0–15% Cu_2O, 0–5% F, 0–35% PbO, 0–35% SnO, 0–35% PbO+SnO, 0–5% ZrO_2, 0–4% SiO_2, and 0–15% MgO+CaO+SrO+BaO+MnO, consisting of 0–10% MgO, 0–10% CaO, 0–10% SrO, 0–12% BaO, and 0–10% MnO.

4,940,678

RARE EARTH OXYNITRIDE GLASSES

Bruce G. Aitken, Painted Post, N.Y., assignor to Corning Incorporated, Corning, N.Y.

Filed Jul. 27, 1989, Ser. No. 385,447
Int. Cl.[5] C03C *3/062, 3/11*
U.S. Cl. 501—73 **3 Claims**

1. A glass consisting essentially, expressed in terms of weight percent on the oxide basis, of 35.5–68.1% Ln_2O_3, wherein Ln_2O_3 consists of at least one rare earth metal oxide selected from the lanthanide series of rare earth metals, 6.3–21.8% Al_2O_3, 20.6–37.4% SiO_2, 4.3–7.2% N and 0–33.6% BaO.

4,940,679

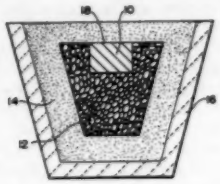
PROCESS FOR PREPARING SELF-SUPPORTING BODIES AND PRODUCTS MADE THEREBY

Terry D. Claar, Newark, Del.; Steven M. Mason, Norwood, Pa.; Kevin P. Pochopien, Newark, Del., and Danny R. White, Elkton, Md., assignors to Lanxide Technology Company, LP, Newark, Del.

Continuation-in-part of Ser. No. 73,533, Jul. 15, 1987. This application Dec. 23, 1987, Ser. No. 137,044

Int. Cl.[5] C04B 35/58; B22F 3/26

U.S. Cl. 501—96 44 Claims



1. A method for producing a self-supporting body, comprising:

selecting a parent metal comprising at least one metal selected from the group consisting of titanium, zirconium, hafnium, vanadium, chromium and niobium;

heating said parent metal in a substantially inert atmosphere to a temperature above its melting point to form a body of molten parent metal;

contacting said body of molten parent metal with a permeable mass comprising boron carbide and a carbon donor material;

maintaining said temperature for a time sufficient to permit infiltration of said molten parent metal into said permeable mass and to permit reaction of said molten parent metal with both said carbon donor material and said boron carbide to form at least one parent metal carbon-containing compound and at least one parent metal boron-containing compound; and

continuing said infiltration and reaction for a time sufficient to react said boron carbide substantially completely to produce said self-supporting body comprising at least one parent metal carbon-containing compound and at least one parent metal boron-containing compound.

4,940,680

SILICON NITRIDE SINTERED MEMBERS

Tomonori Takahashi, Chita, Japan, assignor to NGK Insulators, Ltd., Japan

Filed Sep. 21, 1988, Ser. No. 247,373

Claims priority, application Japan, Sep. 29, 1987, 62-242576

Int. Cl.[5] C04B 35/58

U.S. Cl. 501—97 6 Claims

1. A silicon nitride sintered member consisting essentially of a silicon nitride sintered body and a dense silicon nitride coating layer covering a surface of the silicon nitride sintered body, wherein an intergranular phase of the silicon nitride sintered body is substantially crystalline and said silicon nitride coating layer has a thickness of about 10 μm–1 mm.

4,940,681

FERROELECTRIC CERAMIC MATERIAL

Yoshihisa Ushida; Nobuki Hirai, and Hiroshi Mase, all of Ichihara, Japan, assignors to Mitsui Petrochemical Industries, Ltd., Tokyo, Japan

Filed May 24, 1989, Ser. No. 356,135

Claims priority, application Japan, May 27, 1988, 63-129797; May 27, 1988, 63-129798

Int. Cl.[5] C04B 35/46, 35/48, 35/49

U.S. Cl. 501—134 13 Claims

1. A ferroelectric ceramic material which is a Pervoskite solid solution, which comprises a solid solution represented by the formula:

$$Pb_{1-a}M_a(Mg_{\frac{1}{3}}Nb_{\frac{2}{3}})_x\,Ti_y\,Zr_z\,O_3$$

wherein M is Ba or Sr, x+y+z is 1, a is from 0 to 0.10, x is from 0.05 to 0.70, y is from 0.25 to 0.50 and z is from 0.05 to 0.70, containing in said solution at least one oxide selected from group A noted below and at least one oxide selected from group B noted below, with the proviso that NiO or Fe_2O_3 is necessarily contained:

Group A: La_2O_3, Bi_2O_3 and Nd_2O_3;

Group B: NiO, Fe_2O_3, SnO_2 and Ta_2O_5

wherein the metal ions of the oxide selected from the group B are present in the Perovskite solid solution in such an amount so that the relation:

$$0.5 \leqq N \leqq 5.0$$

is met, in which N is defined by the equation:

$$N = \sum_{j=1} n_{Bj}\,x_{Bj} \Big/ \sum_{i=1} n_{Ai}\,x_{Ai}$$

wherein n_{Ai} and n_{Bj} are valencies of metal ions of the oxides of groups A and B which are present in the solid solution, respectively, and x_{Ai} and x_{Bj} are atom equivalents of metal ions of the oxides of groups A and B which are present in the solid solution, respectively.

4,940,682

SOLID CATALYST COMPONENT FOR OLEFIN POLYMERIZATION

Toshio Sasaki; Takeshi Ebara, both of Ichihara, and Kiyoshi Kawai, Chiba, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Oct. 26, 1988, Ser. No. 262,786

Claims priority, application Japan, Oct. 28, 1987, 62-274258

The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] C08F 4/64

U.S. Cl. 502—113 13 Claims

1. A solid catalyst component for olefin polymerization which comprises a catalyst component comprising a titanium trichloride catalyst or a titanium/magnesium composite catalyst containing chlorine fixed onto a porous substance of which the pore volume, at a pore radius in a range of from 200 to 2,000 Å is 0.3 cc/g or more, said pore volume is 35% or more of the pore volume at a pore radius in a range of from 35 to 75,000 Å, the average particle diameter is from 5 to 300 μm, the geometrical standard deviation of the particle size distribution is 2 or less and the solubility in toluene at 100° C. is 30 wt. % or less, the amount of the catalyst component to be fixed being from 1 to 70 wt. % as a content in the solid catalyst component.

2. A solid catalyst component for olefin polymerization according to claim 1, wherein the porous substance is porous inorganic oxides or porous organic polymers.

4. A solid catalyst component for olefin polymerization according to claim 2, wherein the porous inorganic oxide is

SiO_2, Al_2O_3, MgO, TiO_2, ZrO_2, $SiO_2.Al_2O_3$, $MgO.Al_2O_3$, or $MgO.SiO_2.Al_2O_3$.

4,940,683

POLYMERIZATION PROCESS

Johannes A. Van Doorn; Eit Drent; Petrus W. N. M. Van Leeuwen; Nicolaas Meijboom; Aart B. Van Oort, and Richard L. Wife, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

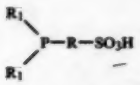
Division of Ser. No. 140,013, Dec. 31, 1987, Pat. No. 4,855,399. This application Feb. 16, 1989, Ser. No. 311,260

Claims priority, application Netherlands, Feb. 26, 1987, 8700476

Int. Cl.[5] B01J *31/04*

U.S. Cl. 502—162 9 Claims

1. The catalyst composition formed from a palladium compound, a quinone and a phosphino-substituted sulfonic acid of up to 30 carbon atoms represented by the formula



wherein R_1 independently is hydrocarbyl or substituted hydrocarbyl wherein any non-hydrocarbyl substituents are polar substituents and R is a divalent hydrocarbyl bridging group of up to 10 carbon atoms having from 1 to 4 carbon atoms in the bridge between the phosphorus and the sulfur atoms.

4,940,684

METHOD FOR PREPARING A CATALYST SUPPORTED ON SILICON CARBIDE OR SILICON NITRIDE

Takeshi Okutani; Yoshinori Nakata; Masaaki Suzuki, all of Sapporo, and Takeo Akiyama, Ayase, all of Japan, assignors to President of Agency of Industrial Science and Technology, Tokyo, Japan

Filed Sep. 27, 1988, Ser. No. 250,136

Claims priority, application Japan, Sep. 28, 1987, 62-242995

Int. Cl.[5] B01J *27/22, 27/24, 32/00*

U.S. Cl. 502—178 3 Claims

1. A method for preparing a catalyst which comprises supporting a catalytic substance on a porous silicon carbide or a porous silicon nitride prepared by subjecting a silicon-accumulated biomass to heat treatment at 300° to 1200° C. under an argon or a nitrogen atmosphere, then at 1300° to 2000° C. for 0.1 to 12 hours in an argon or a nitrogen atmosphere and then at 400° to 800° C. in air.

4,940,685

CERIC OXIDE PARTICULATES HAVING A STABLE SPECIFIC SURFACE AND A PROCESS FOR THEIR PREPARATION

Guy-Noel Sauvion, Chevilly-Larue; Jack Caillod, Taverny, and Claire Gourlaouen, Paris, all of France, assignors to Rhone-Poulenc Specialites Chimique, Courbevoie, France

Filed Jul. 3, 1986, Ser. No. 881,665

Claims priority, application France, Jul. 3, 1985, 85 10137

Int. Cl.[5] B01J *21/06, 23/10, 32/00*

U.S. Cl. 502—263 27 Claims

1. A ceric oxide-based composition, the specific surface of which remains essentially stable at elevated temperatures, which composition includes a carrier comprising a plurality of solid, porous, finely divided ceric oxide particulates, said ceric oxide particulates of said carrier having intimately dispersed therein an effective amount of at least one oxide of a metallic element A comprising silicon, zirconium, or thorium, said ceric oxide particulates having been shaped and calcined;

wherein the amount of the at least one oxide of said metallic element A comprises from about 1 to about 20% by weight of said ceric oxide particulates and wherein the specific surface area of said composition is greater than the specific surface area of said ceric oxide particulates without said metallic element A.

4,940,686

CATALYST FOR OXIDATION OF CARBON MONOXIDE

Patricia A. Tooley, Bartlesville, and John H. Kolts, Ochelata, both of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Aug. 7, 1989, Ser. No. 406,385

Int. Cl.[5] B01J *21/04, 23/64, 23/89*

U.S. Cl. 502—327 14 Claims

1. A composition of matter comprising:

(a) at least one vanadium oxide as support material,

(b) platinum metal, and

(c) an iron component selected from the groups consisting of iron metal, iron oxides and mixtures thereof.

4,940,687

CATALYST AND PROCESS FOR HYDROGENATION OF UNSATURATED HYDROCARBONS

Xin X. Liu; Bing Y. Zhao, both of Beijing, China; Herbert Riegel, Maplewood, and Jo-Lang Chien, Cedar Grove, both of N.J., assignors to Beijing Research Institute of Chemical Industry, Beijing, China and Lummus Crest, Inc., Bloomfield, N.J.

Division of Ser. No. 858,546, Apr. 30, 1986, Pat. No. 4,762,956, which is a continuation of Ser. No. 484,626, Apr. 13, 1983, abandoned. This application Aug. 5, 1988, Ser. No. 229,211

Int. Cl.[5] B01J *21/00*

U.S. Cl. 502—333 11 Claims

1. A catalyst for selectively hydrogenating an impurity selected from the group consisting of acetylenic compounds, dienes, and mixtures thereof consisting essentially of:

palladium supported on an alumina support which is substantially crystalline alpha alumina, said support having been calcined at a temperature of at least 1150° C. and no greater than 1400° C., said palladium being present on said support in an amount effective to catalyze said selective hydrogenation, said catalyst having an average pore radius of from 200 to 2000Å, with at least 80% of the pores having a pore radius within the range of from 100 to 3000Å.

4,940,688

DEVELOPER SHEET AND PROCESS FOR PRODUCING SAME

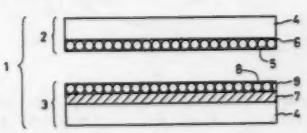
Jun Sakai, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Nagoya, Japan

Filed Dec. 27, 1988, Ser. No. 289,675

Claims priority, application Japan, Dec. 28, 1987, 62-333337

Int. Cl.[5] B41M *5/22*

U.S. Cl. 503—200 4 Claims



1. A developer sheet comprising a base sheet, a first layer of a nucleophilic developer coated on said base sheet, and a second layer of transparent or semitransparent particles containing an ultraviolet-ray absorbent, said second layer being formed on said first layer.

4. A process for producing a developer sheet comprising the steps of preparing a base sheet, forming a first layer of a nucleophilic developer on said base sheet, and forming a second

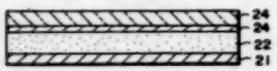
layer of transparent or semitransparent particles containing an ultraviolet-ray absorbent on said first layer.

4,940,689

DISPLAY MATERIAL

Kengo Ito, Kanagawa, Japan, assignor to Sony Corporation, Tokyo, Japan

Filed Jun. 3, 1988, Ser. No. 201,918
Claims priority, application Japan, Jun. 6, 1987, 62-141714
Int. Cl.[5] B41M 5/20
U.S. Cl. 503—202 8 Claims



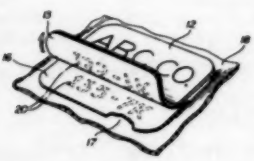
1. A display material comprising a material layer formed on a conducting substrate containing a leuco dye and an electrolyte, said material layer being capable of solid-liquid transformation upon heating and cooling of said layer, and said layer being capable of effecting coloration or discoloration by oxidation and reduction of said dye by applying current to said material layer through said conducting substrate when said material layer is in liquid state.

4,940,690

CLEAN RELEASE LAMINATE CONSTRUCTION WITH LATENT IMAGE

Hugh B. Skees, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Filed Jul. 27, 1988, Ser. No. 224,691
Int. Cl.[5] B41M 5/16, 5/22
U.S. Cl. 503—206 23 Claims



1. A laminate construction comprising a backing sheet, a face sheet covering at least a portion of said backing sheet, and a releasable adhesive securing a first surface of said face sheet to a first surface of said backing sheet such that said face sheet and backing sheet are readily separable, and a first composition located in said releasable adhesive, or on said first surface of said face sheet, or on said first surface of said backing sheet which comprises a colorless reactant and which, when combined with a second colorless reactant at a later time, reacts to form a colored composition which yields a visible image, said first composition, when subjected to an imaging force, forms a latent image.

4,940,691

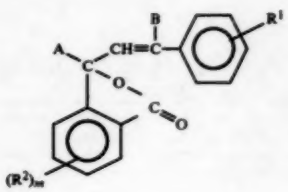
COLORING PHTHALIDE COMPOUNDS AND RECORDING MATERIALS USING THE COMPOUNDS AS COLORING COMPONENT

Kiyotaka Iiyama, Mishima, and Kunio Hayakawa, Gotenba, both of Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

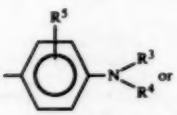
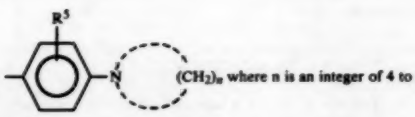
Continuation-in-part of Ser. No. 210,208, Jun. 17, 1988, abandoned, which is a continuation of Ser. No. 84,446, Aug. 12, 1987, abandoned. This application May 19, 1989, Ser. No. 355,962
Claims priority, application Japan, Aug. 14, 1986, 61-191106; Dec. 19, 1986, 61-303540; Jul. 1, 1987, 62-164844
Int. Cl.[5] B41M 5/18
U.S. Cl. 503—220 3 Claims

1. A thermosensitive recording material comprising a substrate and a thermosensitive coloring layer formed on said substrate, which thermosensitive layer comprises:

a coloring phthalide compound having general formula [I],



[I]

wherein A and B each represent  or 

where n is an integer of 4 to 6;

R^1 represents hydrogen, an alkyl group, or halogen, m is an integer of 1 to 4, when m is 1, R^2 represents hydrogen, an amino group, an alkylamino group, a dialkylamino group, a cyclic amino group, an alkyl group, or halogen, when m is 2 to 4, R^2 represents halogen, R^3 and R^4 each represent a straight chain or branched alkyl group having 1 to 8 carbon atoms, a cyclic alkyl group, or a benzyl group, and R^5 represents hydrogen, an alkyl group or an alkoxyl group; and a color developer.

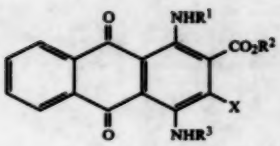
4,940,692

TRANSFER OF DYES

Volker Bach, Neustadt; Ruediger Sens, Mannheim; Karl-Heinz Etzbach, Frankenthal, and Manfred Ruske, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 3, 1989, Ser. No. 331,963
Claims priority, application Fed. Rep. of Germany, Apr. 12, 1988, 3812053
Int. Cl.[5] B41M 5/035, 5/26
U.S. Cl. 503—227 7 Claims

1. A process for transferring a dye from a substrate to an acceptor by applying heat by means of a thermal printing head to a substrate having an ink layer thereon of a binder and at least one dye of the formula (I):



(I)

where

X is H or CN,

R^1, R^2 and R^3 independently of each other are linear or branched C_1–C_{20}-alkyl; alkylcarbonyloxyalkyl, alkoxycarbonyloxyalkyl, alkoxycarbonylalkyl, haloalkyl, hydroxyalkyl or cyanoalkyl, these substituted alkyls having up to 20 carbon atoms; benzyl or phenyl, where the phenyl radical of the benzyl and phenyl are unsubsituted or substituted by C_1–C_{20}-alkyl or C_1–C_{20}-alkoxy; or a radical of formula (II)

$$-Y-O\frac{}{m}R^4$$

where

Y is linear or branched C_2–C_6-alkylene,

m is 1, 2, 3, 4, 5 or 6 and

R^4 is C_1–C_4-alkyl or phenyl,

with the proviso that if X is H, then R^1 and R^3 are each substituted or unsubstituted alkyl or substituted or unsubstituted phenyl, or if X is H and R^1 is H, then R^3 must be unsubstituted or alkyl- or alkoxy-substituted phenyl.

4,940,693

HIGH TEMPERATURE SUPERCONDUCTING THIN FILM STRUCTURE AND METHOD OF MAKING

Joel R. Shappirio; Thomas R. Ancoin, both of Monmouth, and John J. Finnegan, Atlantic Highlands, all of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jul. 28, 1988, Ser. No. 225,439

Int. Cl.[5] B32B *9/00*

U.S. Cl. 505—1 **5 Claims**

1. A high temperature superconducting thin film structure, said structure comprising a substrate and a high T_c superconducting thin film spaced from said substrate, a diffusion barrier layer in the space between said substrate and said high T_c superconducting thin film wherein the diffusion barrier layer is lattice matched both to the substrate and to the superconducting film and wherein the diffusion barrier layer has a high chemical stability, a high melting point, and a high electrical conductivity, and wherein the diffusion barrier layer is a compound selected from the group consisting of YB_2, TbB_2, VN, VC, V_2C_3, CrN, W_2N, GdB, DyB, HoB, the tetragonal tetraborides of Y, Pu, Ce, Sm, and Er, the hexaborides of Ca, Sr, Y, Th, Pu, La, Ce, Pr, Nd, Sm, Eu, Gd, Tb, Dy, Ho, Er, Tm, Yb, and Lu, and the tetrafluoride of Zr, ZrF_4, and wherein the substrate is a single crystal selected from the group consisting of strontium titanate, $SrTiO_3$, yttria-stabilized zirconia, ZrO_2—(Y), alumina, Al_2O_3, and magnesium oxide, MgO, and wherein the superconducting thin film material is selected from the group consisting of $YBa_2Cu_3O_7$, $Tl_2Ba_2CaCu_2O_8$, $Bi_2CaSr_3Cu_2O_{7-x}$, $BiCaSrCu_2O_{7-x}$, $Bi_2Ca_2SrCu_3O_{7-x}$, and $BiCa_2Sr_3Cu_4O_{7-x}$ where x can range from zero to 1.

4,940,694

THERAPEUTIC USE OF GM1 IN SEVERE CEREBRAL ISCHEMIC STROKES PATHOLOGIES

Francesco della Valle, Padova; Aurelio Romeo, Rome, and Silvana Lorenzi, Padova, all of Italy, assignors to Fidia, S.p.A., Abano Terme, Italy

Continuation of Ser. No. 127,603, Nov. 30, 1987, abandoned, which is a continuation of Ser. No. 734,105, May 15, 1985, abandoned. This application Oct. 20, 1988, Ser. No. 338,516

Claims priority, application Italy, Feb. 18, 1985, 47698 A/85

Int. Cl.[5] A61K *31/70*

U.S. Cl. 514—25 **5 Claims**

1. A method for the treatment of cerebral stroke patients which comprises administering to said patients an effective amount of the ganglioside GM_1, or a pharmaceutically acceptable salt of said ganglioside GM_1.

4,940,695

BISMUTH-CONTAINING PHARMACEUTICAL COMPOSITIONS

Leila D. Coveney, Cincinnati, Ohio; Linda C. Jones, Aurora, Ind., and Jerry R. Maney, Mason, Ohio, assignors to The Procter & Gamble Company, Cincinnati, Ohio

Filed Dec. 10, 1987, Ser. No. 130,760

Int. Cl.[5] A61K *31/715, 31/60, 31/29*

U.S. Cl. 514—57 **23 Claims**

1. Pharmaceutical compositions for oral administration comprising:

(a) from about 0.1% to about 50% of at least one pharmaceutically-acceptable bismuth-containing agent;

(b) from about 0.1% to about 25% of at least one pharmaceutically-acceptable non-ionic cellulose ether polymer; and

(c) from about 0.1% to about 25% of magnesium aluminum silicate;

and wherein further the ratio of bismuth to non-ionic cellulose ether polymer is greater than about 1.5:1.

4,940,696

BENZONAPHTHALENE DERIVATIVES AND THEIR USE IN THERAPEUTIC AND COSMETIC COMPOSITIONS

Braham Shroot, Antibes; Jacques Eustache, Cranse, and Jean-Michel Bernardon, Nice, all of France, assignors to Centre International de Recherches Dermatologiques (CIRD), Valbonne, France

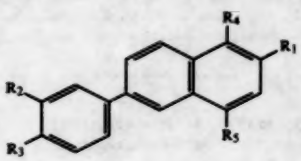
Division of Ser. No. 850,145, Apr. 10, 1986, Pat. No. 4,717,720. This application Nov. 16, 1987, Ser. No. 120,958

Claims priority, application Luxembourg, Apr. 11, 1985, 85849

Int. Cl.[5] A61K *31/045, 31/085, 31/16, 31/19*; C07H *19/00, 21/00, 5/04, 5/06*; C07C *69/76, 63/34, 33/36, 103/28*

U.S. Cl. 514—62 **18 Claims**

1. A benzonaphthalene compound of the formula



wherein

R_1 represents (i)

or (ii) $-CH_2OH$,

R_6 represents

wherein r' and r'' represent hydrogen, lower alkyl, mono or polyhydroxyalkyl, aryl or a residue of an amino sugar selected from the group consisting of glucosamine, galactosamine and mannosamine,

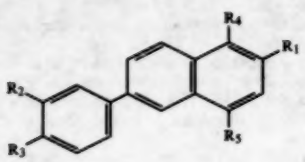
R_2 represents hydrogen, branched or straight chain alkyl having 1–15 carbon atoms, alkoxy having 1–4 carbon atoms or a cycloaliphatic radical,

R_3 represents hydrogen, hydroxy, branched or straight chain alkyl having 1–4 carbon atoms, alkoxy having 1–10 carbon atoms, a cycloaliphatic radical selected from the group consisting of 1-methyl cyclohexyl and 1-adamantyl, a thiocycloaliphatic radical, or $-O-Si(CH_3)_2-R_8$ wherein R_8 represents linear or branched lower alkyl, and

R_4 and R_5 each independently represent hydrogen, lower alkyl, hydroxy or lower acyloxy,

or a salt thereof.

13. A benzonaphthalene compound of the formula



wherein

R_1 represents

wherein R_7 represents hydrogen, alkyl having 1–20 carbon atoms, monohydroxyalkyl or polyhydroxyalkyl,

R_2 represents hydrogen, branched or straight chain alkyl having 1–15 carbon atoms or alkoxy having 1–4 carbon atoms,

R_3 represents hydrogen, hydroxy, branched or straight chain alkyl having 1–4 carbon atoms, alkoxy having 1–10 carbon atoms, or $-O-Si(CH_3)_2-R_8$ wherein R_8 represents linear or branched alkyl,

R_4 and R_5 each independently represent hydrogen, lower alkyl or lower acyloxy,

or a salt thereof.

15. A pharmaceutical composition comprising a pharmaceutically acceptable vehicle suitable for enteral, parenteral, topical or ocular administration and an effective amount of as the active principle at least one compound of claim 1 or a salt thereof.

4,940,697

INJECTION MATERIAL FOR COSMETIC TREATMENT

Atsushi Saisho, 3-9-10, Miyamaedaira, Miyamae-ku, Kawasaki-shi, Kanagawa, Japan

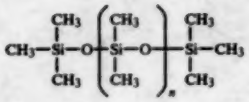
Filed Jun. 8, 1988, Ser. No. 204,188

Claims priority, application Japan, Dec. 4, 1987, 62-305812

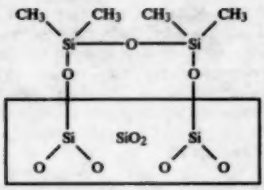
Int. Cl.[5] A61K *31/695*

U.S. Cl. 514—63 1 Claim

1. A hypodermically injectable composition for cosmetic plastic surgery, which consists essentially of a mixture of (1) dimethylopolysiloxane oil suitable for subcutaneous hypodermic injection into the patient's body, said oil having a viscosity of 12,500 cSt and having the following formula:



and, (2) from 20 to 30 percent by weight of hydrophobic silica filler having the following formula:



said filler having been prepared by reacting dimethyldichlorosilane with the silanol groups on the surface of silica, at about 400° C., and removing the hydrogen chloride that is formed by the reaction.

4,940,698

INSECTICIDAL THIONOPHOSPHONATES

Fritz Maurer, Wuppertal; Bernhard Homeyer, Leverkusen, and Wolfgang Behrenz, Overath, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

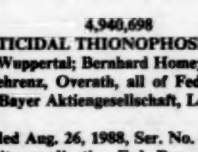
Filed Aug. 26, 1988, Ser. No. 237,241

Claims priority, application Fed. Rep. of Germany, Sep. 2, 1987, 3729263

Int. Cl.[5] A01N *57/24;* C07F *9/65*

U.S. Cl. 514—86 13 Claims

1. An O-(6-methyl-2-alkyl-pyrimidin-4-yl) O-alkyl thionoalkanephosphonate of the formula



(I)

in which

R stands for methyl or ethyl, and

R^1 stands for methyl or ethyl.

4,940,699

THIOPHOSPHORIC ACID ESTER AS A SOIL PEST CONTROLLING AGENT

Yoshikazu Itoh, Ibaraki; Makoto Hatakoshi, Toyonaka, and Mitsuru Sasaki, Toyonaka, all of Japan, assignors to Sumitomo Chemical Company, Limited, Osaka, Japan

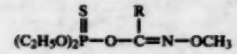
Continuation-in-part of Ser. No. 258,761, Oct. 17, 1988, abandoned. This application Apr. 28, 1989, Ser. No. 344,409

Claims priority, application Japan, Oct. 30, 1987, 62-276830

Int. Cl.[5] A01N *57/12;* C07F *9/165*

U.S. Cl. 514—114 6 Claims

1. A soil pest controlling agent containing a compound of the formula (I),



(I)

wherein R is a methyl or ethyl group, as an active ingredient.

4,940,700

SECO-STEROL COMPOUNDS EFFECTIVE IN INDUCING CELL DIFFERENTIATION

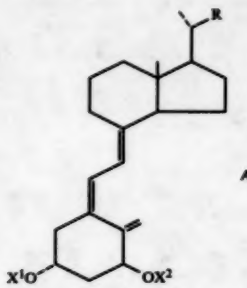
Hector F. DeLuca; Heinrich K. Schnoes, and Wan F. Lau, all of Madison, Wis., assignors to Wisconsin Alumni Research Foundation, Madison, Wis.

Continuation of Ser. No. 726,496, Apr. 23, 1985, abandoned. This application Apr. 30, 1987, Ser. No. 367,126

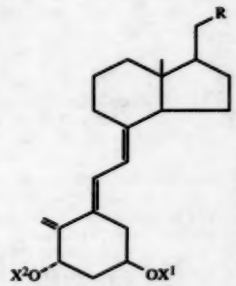
Int. Cl.[5] A61K *31/59*; C07J *9/00, 1/00*

U.S. Cl. 514—167 **12 Claims**

1. A compound selected from the group consisting of



AND



wherein R is selected from the group consisting of methyl, ethyl and propyl and wherein X^1 and X^2 represent, independently, hydrogen or an acyl group.

4,940,701

TOPICAL DRUG RELEASE SYSTEM

Adrian F. Davis, Weybridge, England, assignor to Beecham Group p.l.c., England

Continuation-in-part of Ser. No. 693,770, Jan. 23, 1985, Pat. No. 4,767,751. This application Dec. 10, 1987, Ser. No. 131,015

Claims priority, application United Kingdom, Jan. 25, 1984, 8401965; Dec. 11, 1986, 8629639

The portion of the term of this patent subsequent to Aug. 30, 2005, has been disclaimed.

Int. Cl.[5] A61K *31/56*

U.S. Cl. 514—179 **10 Claims**

1. In a pharmaceutical composition for topical application, comprising a first liquid phase and a second liquid phase different from the first phase but miscible with the first phase upon admixture therewith, at least one of said phases comprising a drug dissolved therein, the concentration of said drug in each phase in which said drug is present and the composition of the phases being such that, on admixture of the phases, the total drug concentration in the initially formed resultant mixture is greater than the saturated drug solubility in said initially formed resultant mixture, whereby said resultant mixture is supersaturated with the drug, the improvement wherein at least one of said first and second phases comprises from 0.01 to 2% by weight, based on the total weight of the composition, of an antinucleating agent.

4,940,702

CEPHEM COMPOUNDS

Stephen C. Finch, and Michael J. Pearson, both of Betchworth, United Kingdom, assignors to Beecham Group p.l.c., England

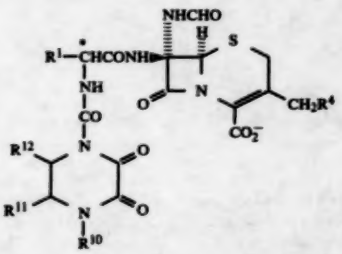
Filed Aug. 8, 1986, Ser. No. 894,926

Claims priority, application United Kingdom, Aug. 10, 1985, 8520155; Feb. 6, 1986, 8602956

Int. Cl.[5] C07D *501/57*; A61K *31/545*

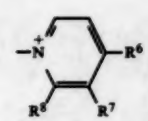
U.S. Cl. 514—201 **15 Claims**

1. A compound of the formula (II):

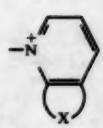


(II)

a pharmaceutically acceptable salt thereof or an in vivo hydrolyzable ester thereof wherein R^1 is phenyl unsubstituted or substituted with up to 3 moieties selected from the group consisting of acetoxy, hydroxy and chloro, or R^1 is 2-thienyl or 2-furyl; R^4 is a substituted pyridinium moiety of the formula (a) or (b):



(a)



(b)

wherein one of R^6, R^7 and R^8 is alkyl to 1 to 6 carbon atoms; or cycloalkyl of 3 to 7 carbon atoms; and the other 2 of R^6, R^7 and R^8 are hydrogen; or R^6 is 2-pyridyl and R^7 and R^8 are hydrogen; X is $-(CH_2)_n-$ wherein n is an integer having the value 2, 3 or 4; or X together with the bond in the ring to which it is joined forms a 6-membered aromatic carbocyclic ring, R^{10} is alkyl of 1 to 4 carbon atoms; and R^{11} and R^{12} are each hydrogen.

4,940,703

SPIROCYCLIC COMPOUNDS INCORPORATING FIVE-MEMBERED RINGS WITH TWO HETEROATOMS FOR TREATING PSYCHOTIC DISORDERS, ETC.

Raymond Baker, Much Hadham; Clare O. Kneen, Little Walden; John Saunders, Bishops Stortford, and Christopher Swain, Duxford, all of England, assignors to Merck Sharp & Dohme Limited, Hoddesdon, England

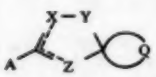
Filed Apr. 4, 1989, Ser. No. 333,076

Claims priority, application United Kingdom, Apr. 11, 1988, 8808433

Int. Cl.[5] **A61K** *31/55;* **C07D** *451/00, 453/00*

U.S. Cl. 514—210 **8 Claims**

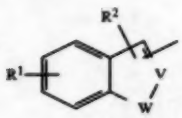
1. A compound of formula I or a salt or prodrug thereof:



(I)

wherein the dotted line represents an optional chemical bond in one of the two possible positions;

A represents a group of formula II:



(II)

in which

R^1 is selected from the group consisting of hydrogen, hydroxy, C_{1-6} alkyl, C_{2-6} alkenyl, C_{2-6} alkynyl, C_{1-6} alkoxy, benzyloxy, hydroxy(C_{1-6})alkyl, halogen, amino, cyano, nitro, $—CONR^6R^7$ and $—SO_2NR^6R^7$, in which R^6 and R^7 are independently selected from the group consisting of hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl and C_{2-6} alkynyl;

R^2 is selected from the group consisting of hydrogen, halogen, C_{1-6} alkyl, C_{1-6} alkoxy and C_{1-6} alkylcarbonyl;

V represents nitrogen,

and

W represents oxygen, sulphur or

in which R^8 is selected from the group consisting of hydrogen, C_{1-6} alkyl, C_{2-6} alkenyl and C_{2-6} alkynyl;

two of X, Y and Z are the same or different and each represents oxygen, sulphur or nitrogen; and the remaining group X, Y or Z is carbon, or Y is carbonyl (C=O); and

Q is the residue of an azacyclic or azabicyclic ring system.

8. A method for the treatment of psychotic disorders; anxiety; alcohol or drug withdrawal or dependence; pain; gastric stasis; gastric dysfunction; migraine, nausea and vomiting; movement disorders; and presenile and senile dementia; which method comprises administering to a patient in need of such treatment an effective amount of a compound according to claim **1**.

4,940,704

PYRIDO[3,4-B][1,4]BENZOXAZEPINES

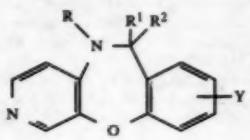
Richard C. Effland, and Joseph T. Klein, both of Bridgewater, N.J., assignors to Hoechst-Roussel Pharmaceutical Inc., Somerville, N.J.

Filed Aug. 16, 1989, Ser. No. 394,613

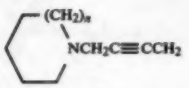
Int. Cl.[5] **C07D** *498/04;* **A61K** *31/55*

U.S. Cl. 514—211 **26 Claims**

1. A compound of the formula



wherein R is hydrogen, loweralkyl, loweralkanoyl, a group of the formula $(CH_2)_mNR^3R^4$ wherein R^3 and R^4 are loweralkyl and m is 2 or 3, a group of the formula $CH_2C{\equiv}CH$, a group of the formula



wherein n is 0 or 1; R^1 and R^2 are hydrogen; R^1 and R^2 taken together with the carbon atom to which they are attached form a group of the formula C=O; Y is hydrogen, loweralkyol, halogen, loweralkoxy, or trifluoromethy; an optical isomer thereof; or a pharmaceutically acceptable salt thereof.

13. A method of treating depression in mammals comprising administering to a mammal requiring depression treatment, a depression treating amount of a compound of claim **1**.

4,940,705

N-SUBSTITUTED DERIVATIVES OF 1-DESOXYNOJIRIMYCIN AND 1-DESOXYMANNONOJIRIMYCIN AND PHARMACEUTICAL USE

Horst Böshagen, Haan; Bodo Junge, Wuppertal; Arnold Paessens, Haan, and Matthias Schüller, Wuppertal, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

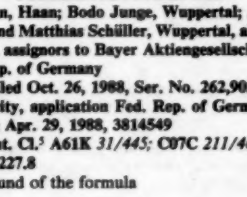
Filed Oct. 26, 1988, Ser. No. 262,902

Claims priority, application Fed. Rep. of Germany, Oct. 30, 1987, 3736771; Apr. 29, 1988, 3814549

Int. Cl.[5] **A61K** *31/445;* **C07C** *211/46*

U.S. Cl. 514—227.8 **9 Claims**

1. A compound of the formula



in which

R or R′ stands for a hydroxyl group and in which the other R′ or R in each case stands for hydrogen,

n stands for a number from 1 to 6,

R^1

stands for hydrogen, or

for straight-chain or branched alkyl having up to 3 carbon atoms or for benzyl, and

R^2

stands for straight-chain or branched alkyl having up to 8 carbon atoms which is substituted by aryl having 6 to 10 carbon atoms, where the aryl is radical is unsubstituted or substituted by up to 4 identical or different substituents selected from the group consisting of fluorine; chlorine; bromine; iodine; cyano; nitro; alkyl, alkoxy, alkylthio and arylthio each having up to 6 carbon atoms; dioxymethylene; dioxyethylene; trifluoromethyl; trifluoromethoxy; difluoromethoxy; carboxyl and alkoxycarbonyl having up to 4 carbon atoms, or which can be substituted by pyridyl; thienyl; furyl; pyrimidyl; pyridazinyl; pyrazinyl or quinolyl, or

stands for cycloalkyl having 3 to 7 carbon atoms, or

stands for aryl having 6 to 10 carbon atoms, where the aryl radical is unsubstituted or monosubstituted to tetrasubstituted by fluorine, chlorine, bromine, iodine, cyano, alkyl having up to 6 carbon atoms, alkoxy having up to 12 carbon atoms, alkylsulphonyl having up to 4 carbon atoms, trifluoromethyl, difluoromethylene, trifluoromethylthio, dioxymethylene, dioxyethylene, by cycloalkyl having 3 to 7 carbon atoms, by carboxyl or alkoxycarbonyl having up to 4 carbon atoms, by aryloxy having 6 to 10 carbon atoms, where the aryl radical of the aryloxy is unsubstituted or is substituted by up to 4 identical or different substitutents selected from the group consisting of fluorine; chlorine; bromine; iodine, cyano, hydroxyl; nitro; alkyl, alkoxy, alkylthio having up to 6 carbon atoms; dioxymethylene; dioxyethylene; trifluoromethyl; trifluoromethoxy; or difluoromethoxy; or by halogenoalkoxy having up to 6 carbon atoms and up to 5 fluorine and/or 3 chlorine atoms; or by hydroxyalkoxy, hydroxyalkyl and cyanoalkyl each having up to 8 carbon atoms; and alkenyloxy having up to 6 carbon atoms; or by a group $-XR^3$, the substituents being identical or different,

where

X denotes a straight-chain or branched alkylene or alkenylene chain having up to 8 carbon atoms, and

R^3 denotes aryl having 6 to 10 carbon atoms,

where

the aryl radical is unsubstituted or substituted by up to 4 identical or different substituents selected from the group consisting of fluorine; chlorine; bromine; iodine; cyano; alkyl, alkoxy, alkylthio having up to 6 carbon atoms; nitro; dioxymethylene; dioxyethylene; trifluoromethyl; trifluoromethoxy; difluoromethoxy; and trifluoromethylthio, or R^3

denotes a 5- or 6-membered saturated or unsaturated heterocyclic ring which can be fused to benzene and which can contain oxygen, sulphur or up to 2 nitrogen atoms as hetero atoms, or

denotes hydroxyl, carboxyl, alkoxycarbonyl having up to 6 carbon atoms, alkylcarbonyloxy having up to 18 carbon atoms, or R^3

denotes a group $-OSO_3H$, $-CONH-NH_2$, $-CONH_2$, amino or alkylamino or dialkylamino each having up to 6 carbon atoms per alkyl group, or R^3

denotes hydroxyalkyl having up to 8 carbon atoms, or

R^3 denotes a saturated, bridged heterocycle or

R^1 and R^2, together with the nitrogen atom, form a 5- to 6-membered ring which can be anellated, which can be interrupted by oxygen, sulphur or the group $-NR^4$, and which can be substituted by alkyl having up to 4 carbon atoms, hydroxyl, phenyl, carboxyl or alkoxycarbonyl having up to 4 carbon atoms,

where

R^4

denotes aryl having 6 to 10 carbon atoms, where the aryl radical is unsubstituted or substituted by up to 4 identical or different substituents selected from the group consisting of fluorine; chlorine; bromine; iodine; cyano; nitro; hydroxyl; alkyl, alkoxy, alkylthio having up to 6 carbon atoms; dioxymethylene; dioxyethylene; trifluoromethyl; trifluoromethoxy and difluoromethoxy, or R^4

denotes alkoxycarbonyl having up to 6 carbon atoms, or R^4

denotes pyridyl, pyrimidyl, furyl, thienyl, pyrazinyl, pyridazinyl or quinolyl, or R^4

denotes cycloalkyl having 3 to 7 carbon atoms, or R^4

denotes alkyl or alkenyl having up to 6 carbon atoms which is unsubstituted or monosubstituted or disubstituted by phenyl which is unsubstituted or substituted by chlorine, dioxymethylene or trifluoromethyl, hydroxyl, amino, alkylamino, dialkylamino each having up to 3 carbon atoms per alkyl group, fluorine, bromine, cycloalkyl having 3 to 6 carbon atoms, by carboxyl or alkoxycarbonyl having up to 6 carbon atoms, by pyridyl, pyrimidyl, pyrazinyl, morpholinyl, thiomorpholinyl, pyrrolidinyl or pyrrolidinocarbonyl, by morpholinocarbonyl, by alkylaminocarbonyl, dialkylaminocarbonyl or phenylalkylaminocarbonyl each having up to 6 carbon atoms per alkyl group, the substituents being identical or different.

7. A method of combating viral infections comprising administering to a patient having a viral infection an antiviral effective amount of one or more compounds according to claim 1.

9. A method for the treatment and prophylaxis of diseases produced by retroviruses comprising administering to a patient in need of such treatment or prophylaxis an effective amount therefor of one or more compounds according to claim 1.

4,940,706

2,4-DISUBSTITUTED 1,3-DIOXOLANES AND PHARMACEUTICAL USE

Javier Bartroli; Manuel Anquita, and Elena Carceller, all of Barcelona, Spain, assignors to J. Uriach & Cia, S.A., Spain

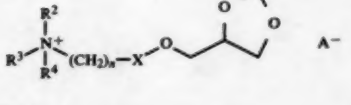
Filed Oct. 13, 1988, Ser. No. 257,092

Claims priority, application Spain, Oct. 13, 1987, 8702901

Int. Cl.[5] A61K *31/335;* C07D *317/28, 317/30*

U.S. Cl. 514—231.5 **8 Claims**

1. 2,4-Disubstituted 1,3-dioxolanes of formula I



I

where:

-R^1 represents a linear or branched alkyl, alkenyl or alkynyl group, of 10 to 24 carbon atoms;

-X is a simple covalent bond (i.e. it does not represent any group), or is one of the following groups: $-C(=O)-$, $-O-C(=O)-$, $-NH-C(=O)-$, or $-NR^5-C(=O)=$, R^5 being a lower alkyl or lower acyl group;

-n is an integer 2 to 10;

-R^2, R^3, and R^4 are lower alkyl groups or $R^2R^3R^4N^+$ represents an aromatic cyclic ammonium group or $R^2R^3R^4N+$ represents a non-aromatic cyclic group in which two of the substituents (R^2, R^3, or R^4) form a ring together with the nitrogen atom, and the remaining group is hydrogen or lower alkyl;

-A^- is a pharmaceutically acceptable anion such as halide, lower alkyl sulfonate, arylsulfonate or carboxylate.

8. A method for treating a patient suffering from a PAF-mediated illness which comprises administering to said patient an effective dose of a compound of formula I in combination with a pharmaceutically acceptable excipient.

4,940,707

STILBENE DERIVATIVES FOR TREATMENT OF SKIN DISORDERS

Michael Klaus, Weil am Rhein, Fed. Rep. of Germany; Peter Mohr, Basel, Switzerland, and Ekkehard Weiss, Inzlingen, Fed. Rep. of Germany, assignors to Hoffman-La Roche Inc., Nutley, N.J.

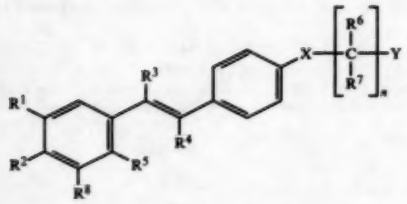
Filed Feb. 14, 1989, Ser. No. 310,442

Claims priority, application Switzerland, Feb. 24, 1988, 689/88; Dec. 14, 1988, 4622/88

Int. Cl.[5] A61K *31/38*; C07D *295/10*, *295/08*

U.S. Cl. 514—237.8 10 Claims

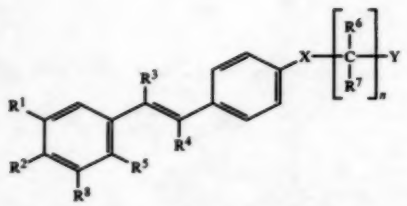
1. A compound of the formula



I

wherein R^1 and R^2 each independently is lower-alkyl; or together are alkylene with 3–5 C-atoms in a straight chain; or together are alkylene with 3–5 C-atoms in a straight chain wherein said alkylene is lower-alkyl substituted; one of the residues R^3 and R^4 is hydrogen and the other is hydrogen or lower-alkyl; R^6 and R^7 are hydrogen or lower-alkyl; R^5 and R^8 are hydrogen, lower-alkyl, lower-alkoxy or halogen; X is —O—, —S—, —SO—, —SO_2— or —NR^9; R^9 is hydrogen, lower-alkyl or acyl; Y is morpholino attached via the N-atom; and n is 2, 3 or 4.

10. A pharmaceutical composition comprising an effective amount of a compound the formula



I

wherein R^1 and R^2 each independently is lower-alkyl; or together are alkylene with 3–5 C-atoms in a straight chain; or together are alkylene with 3–5 C-atoms in a straight chain wherein said alkylene is lower-alkyl substituted; one of the residues R^3 and R^4 is hydrogen and the other is hydrogen or lower-alkyl; R^6 and R^7 are hydrogen or lower-alkyl; R^5 and R^8 are hydrogen, lower-alkyl, lower-alkoxy or halogen; X is —O—, —S—, —SO—, —SO_2— or —NR^9; R^9 is hydrogen, lower-alkyl or acyl; Y is morpholino attached via the N-atom; and n is 2, 3 or 4 and a pharmaceutically inert carrier material.

4,940,708

4-ARYLSULFONYL-3,4-DIHYDRO-2(1H)-QUINOXALINONE-1-ALKANOIC ACIDS, ESTERS, AND SALTS

Reinhard Sarges, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

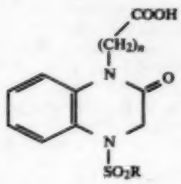
PCT No. PCT/US86/02335, § 371 Date Jun. 30, 1988, § 102(e) Date Jun. 30, 1988

PCT Filed Oct. 30, 1986, Ser. No. 424,298

Int. Cl.[5] C07D *241/50*; A61K *31/495*

U.S. Cl. 514—249 18 Claims

1. A 4-arylsulfonyl-3,4-dihydro-2(1H)-quinoxalinone-1-alkanoic acid compound of the formula:



or a C_1–C_6 alkyl ester derivative thereof, or a base salt of said acid with a pharmacologically acceptable cation, wherein R is phenyl, hydroxyphenyl, fluorophenyl, chlorophenyl, dichlorophenyl, bromophenyl, C_1–C_4 alkylphenyl or C_1–C_4 alkoxyphenyl; and n is one or two.

4,940,709

PIPERAZINE COMPOUND AS PAF-ANTAGONIST

Norihiko Shimazaki; Keiji Hemmi, both of Ibaraki; Osamu Nakaguti, Toyonaka; Yoshio Miyazaki, Itami, and Masashi Hashimoto, Ibaraki, all of Japan, assignors to Fujisawa Pharmaceutical Co., Ltd., Osaka, Japan

Continuation-in-part of Ser. No. 31,577, Mar. 30, 1987, Pat. No. 4,806,538, which is a continuation of Ser. No. 790,082, Oct. 22, 1985, abandoned. This application Nov. 20, 1987, Ser. No. 123,324

Claims priority, application United Kingdom, Nov. 2, 1984, 8427735; Apr. 23, 1986, 8609908; Dec. 31, 1986, 8631082

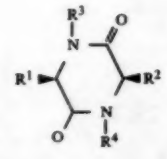
The portion of the term of this patent subsequent to Feb. 21, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/495*; C07D *241/08*

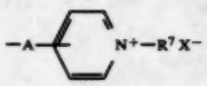
U.S. Cl. 514—253 1 Claim

1. A method for the prevention and treatment of diseases caused by platelet activating factor, comprising:

administering to a subject a therapeutically effective amount of a piperazine compound of the formula:



wherein R^1 is aryl, ar(lower)alkyl which may have lower alkoxy, indolyl(lower)alkyl, benzothienyl(lower)alkyl, quinolyl(lower)alkyl, pyridyl(lower)alkyl, thiazolyl(lower)alkyl, N-loweralkylindolyl(lower)alkyl, N-loweralkyltetrahydropyridyl(lower)alkyl, N-loweralkylindolyl(lower)alkyl having a phenyl group on the indole ring, or a group of the formula:



wherein
A is lower alkylene, R^7 is lower alkyl and X is a halide;
R^2 is C_{1-22} alkyl, lower alkylthio(lower)alkyl, lower alkenylthio(lower)alkyl, hydroxy(lower)alkyl, lower alkanoyloxy or ar(lower)alkoxy protected hydroxy(lower)alkyl, amino(lower)alkyl, lower alkanoyl, aroyl, or ar(lower)alkoxycarbonyl protected amino(lower)alkyl, carboxy(lower)alkyl, lower alkoxycarbonyl or ar(lower)alkoxycarbonyl protected carboxy(lower)alkyl, arylthio(lower)alkyl, ar(lower)alkylthio(lower)alkyl, N-loweralkylindolyl(lower)alkyl, N-loweralkylindolyl(lower)alkyl having 1 or 2 lower alkyl groups on the indole ring, N-lower alkylindolyl(lower)alkyl having halogen substitution on the indole ring, N-lower alkylindolyl(lower)alkyl having lower alkyl and halogen substitution on the indole ring, N-lower alkyl indole(lower)alkyl having lower alkoxy substitution on the indole ring, N-loweralkylindolyl(lower)alkyl having phenyl substitution on the indole ring, N-loweralkylindolyl(lower)alkyl substituted by phenyl(lower)alkoxy on the indole ring, substituted by phenyl-disubstituted lower alkyl, or N-lower alkylindolyl- and phenyl-disubstituted lower alkyl; and
R^3 and R^4 are each hydrogen or lower alkyl; or a pharmaceutically acceptable salt thereof.

4,940,710
7-(SUBSTITUTED)PIPERAZINYL-1-ETHYL-6-FLUORO-1,4-DIHYDRO-4-OXO-3-QUINOLINECARBOXYLIC ACIDS

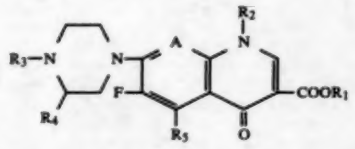
Phaik-Eng Sum, New City, N.Y.; Joseph P. Joseph, Montvale, N.J.; Carl B. Ziegler, Jr., Congers, N.Y.; Daniel B. Moran, Suffern, N.Y., and Yang-I Lin, Nanuet, N.Y., assignors to American Cyanamid Company, Stamford, Conn.

Continuation-in-part of Ser. No. 940,133, Dec. 17, 1986, abandoned, which is a continuation-in-part of Ser. No. 820,279, Jan. 17, 1986, abandoned. This application Aug. 5, 1987, Ser. No. 81,786

Int. Cl.[5] A61K *31/495*; C07D *401/04*

U.S. Cl. 514—254 **11 Claims**

1. A compound of the formula:



wherein R_1 is hydrogen, alkyl(C_1–C_3), dialkyl(C_1–C_3)aminoalkyl(C_1–C_3), N-piperidinoalkyl(C_1–C_3), N-morpholinoalkyl(C_1–C_3), N-4-methylpiperidinoalkyl(C_1–C_3), 3-substituted-N-piperazinyl, N-4-alkyl(C_1–C_3)piperazinylalkyl(C_1–C_3), R_7 —CH—OR_6 where R_6 is acyl or $COOR_8$, R_8 is alkyl(C_1–C_3) and R_7 is hydrogen or alkyl(C_1–C_3), or an alkali or alkaline earth metal; R_2 is alkyl(C_1–C_4), cycloalkyl(C_3–C_6), alkoxy(C_1–C_4), alkylamino(C_1–C_3), vinyl phenyl, benzyl, —CH_2CH_2F or mono- or polysubstituted phenyl (wherein the substituent is halogen, CF_3 or OCH_2F); R_3 is hydrogen, benzyl, or alkyl(C_1–C_3); R_4 is fluoromethyl, difluoromethyl, trifluoromethyl, cyclopropyl, ethenyl, ethynyl, 5 or 6-membered ring heteroaryl or substituted heteroaryl having at least one —O—, —N—, or —S—, that is not 2-furanyl or 2-theinyl; R_5 is hydrogen or fluoro; A is =N—, =CH—, or =CF—; and when R_1 is hydrogen, the pharmacologically acceptable salts thereof.

5. A composition of matter in dosage unit form comprising from 100 to 750 mg of a compound selected from those of claims 1 and 2 in association with a pharmaceutically acceptable carrier.

4,940,711
ANTIHYPERTENSIVE N-PIPERAZINYLALKANOYLANILIDES

Dante Nardi; Amedeo Leonardi; Alberto Catto, and Gabriele Graziani, all of Milan, Italy, assignors to Recordati, S.A., Chemical and Pharmaceutical Company, Chiasso, Switzerland

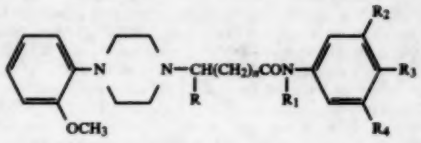
Continuation of Ser. No. 578,374, Feb. 8, 1984, abandoned. This application Jun. 30, 1989, Ser. No. 373,451

Claims priority, application United Kingdom, Feb. 12, 1983, 8303946

Int. Cl.[5] A61K *31/495*; C07D *295/10*

U.S. Cl. 514—255 **16 Claims**

1. An N-piperazinylalkanoylanilide having the formula I or a pharmaceutically acceptable non-toxic salt thereof:



(I)

wherein n is 0, 1 or 2; R represents a hydrogen atom or an alkyl group; R_1 represents a hydrogen atom; one of R_2 and R_3 represents a hydrogen atom and the other of R_2 and R_3 represents a hydroxyalkyl, alkylthio, alkylsulphonyl, alkylsulphonyl, alkanoyl, carbamoyl or guanidinosulphonyl group; or a group of the formula $SO_2NR_5R_6$ in which each of R_5 and R_6 independently represents a hydrogen atom or an alkyl, phenyl or alkanoyl group; or one of R_2 and R_3 represents a halogen atom and the other of R_2 and R_3 represents a sulphamoyl group; and R_4 is a hydrogen atom; said alkyl group having from 1 to 4 carbon atoms.

15. A method of promoting an antihypertensive effect in a warm-blooded animal in need thereof comprising administering thereto an antihypertensively effective amount of the N-piperazinylalkanoylanilide according to claim 1.

4,940,712
DERIVATIVES OF HYDROXYPRIMIDINES AS LEUKOTRIENE SYNTHESIS INHIBITORS

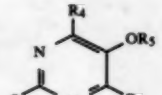
Frederick J. Walker, Preston, and Lawrence S. Melvin, Ledyard, both of Conn., assignors to Pfizer Inc., New York, N.Y.

Filed May 26, 1989, Ser. No. 358,032

Int. Cl.[5] A61K *31/505*; C07D *239/47, 239/56, 401/04*

U.S. Cl. 514—272 **23 Claims**

1. A compound of the formula

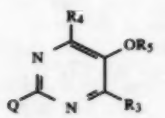


I

wherein Q is R_1R_2N—or SO_nR_{10}, wherein n is an integer from 0 to 2, R_1 is hydrogen, (C_1–C_{15})alkyl, (C_1–C_{15})alkyl -(C_3–C_8)cycloalkyl, (C_2–C_{15})alkenyl - (C_3–C_8)cycoalkyl, (C_2–C_{15})alkynyl - (C_3–C_8)cycloalkyl, (C_3–C_{15})alkynyl, a heteroaryl containing group selected from heteroaryl - (C_1–C_{10})alkyl, heteroaryl - (C_1–C_{10})alkenyl, and heteroaryl - (C_1–C_{10})alkynyl, wherein the heteroaryl moiety is selected from the group consisting of thiophene and furane, (C_7–C_{20})phenylalkenyl, substituted (C_7–C_{20})phenylalkenyl, (C_7–C_{20})phenylalkynyl, substituted (C_7–C_{20})phenylalkynyl, (C_1–C_6 alkoxy)-(C_2–C_6)-alkyl, phenoxy - (C_2–C_6)alkyl, substituted phenoxy - (C_2–C_6)-

alkyl, (C_1–C_6)alkoxy(C_6–C_6)alkenyl, (C_1–C_6)alkoxy -(C_2–C_6)alkynyl, phenoxy -(C_2–C_6)alkenyl, substituted phenoxy- (C_2–C_6)alkenyl, phenoxy -(C_2–C_6)alkynyl, substituted phenoxy- (C_2–C_6)alkynyl, or (C_7–C_{12}- phenylalkyl-(C_7–C_{12})phenylalkyl; R_2 is hydrogen, (C_1–C_{15})alkyl, cyclopentyl, cyclohexyl, (C_3–C_{15})alkenyl, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl, substituted (C_7–C_{20})phenylalkyl or (C_3–C_8)cycloalkyl -(C_1–C_{15})alkyl; or R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidinyl or piperidyl group which may be substituted by one (C_1–C_6)alkyl, phenyl or (C_7–C_{20})phenylalkyl; R_3 and R_4 are independently selected from the group consisting of hydrogen, (C_1–C_6)alkyl, phenyl, substituted phenyl, (C_1–C_{20})phenylalkyl, substituted (C_7C_{20})phenylalkyl, furyl, thienyl, furyl substituted by one (C_1–C_3)alkylo, thienyl substituted by one (C_1–C_3)alkyl, (C_1–C_6)alkyl substituted with carbonyl, chloro, fluoro, bromo, iodo, trifluoromethyl, hydroxy or alkoxy (C_1–C_3), (C_2–C_6)alkenyl, (C_2–C_6)alkynyl, (C_3–C_6)cycloalkyl, (C_1–C_{15})alkyl -(C_3–C_8)cycloalkyl, (C_2–C_{15})alkenyl-(C_3–C_8-)cycloalkyl; or (C_2–C_{15})alkynyl-(C_3–C_8)cycloalkyl; R_5 is —COR_6, —$CH(CH_3)OCOOR_{11}$, or —CH_2OCOOR_{11}; R_6 is hydrogen, (C_1–C_{10}) alkyl, (C_1–C_{10})alkoxy, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl, substituted (C_7–C_{20})-phenylalkyl, (C_2–C_3)alkylcarboxy, —NR_8R_9, wherein R_8 and R_9 are independently selected from the group consisting of (C_1–C_{10})-alkyl, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl and substituted (C_7–C_{20})phenylalkyl; R_{10} is (C_5–C_{15})alkyl, (C_5–C_{15})alkenyl, phenyl, substituted phenyl, (C_7–C_{20})phenylaikyl, substituted (C_7–C_{20})phenylalkyl, (C_7–C_{20})phenylalkyl-(C_7–C_{20})-phenylalkyl- (C_7–C_{20})-phenylalkyl, (C_1–C_{17})alkyl-(C_3–C_8)cycloalkyl, (C_2–C_{17})alkenyl- (C_3–C_8)cycloalkyl, (C_2–C_{17})alkynyl- (C_3–C_8)cycloalkyl, C_5–C_{15})- alkynyl, a heteroaryl containing group selected from heteroaryl(C_1–C_{10})alkyl, heteroaryl- (C_1–C_{10})alkenyl, and heteroaryl- (C_1–C_{10})alkynyl, wherein the heteroaryl moiety is selected from the group consisting of thiophene, and furane, (C_7–C_{20})-phenylalkenyl, substituted (C_7–C_{20})phenylalkenyl, (C_7–C_{20})-phenylalkynyl, substituted (C_7–C_{20})phenylalkynyl, (C_1–C_6)alkoxy- (C_4–C_6)alkyl, phenoxy- (C_2–C_6)alkyl, substituted phenoxy- (C_2–C_6)alkyl, (C_3–C_6)alkyl, (C_1–C_6)alkoxy- (C_3–C_6-)alkenyl, (C_1–C_6)alkenyl, (C_1–C_6-)alkoxy- (C_3–C_6)alkynyl, phenoxy- (C_3–C_6)alkenyl, substituted phenoxy- (C_3–C_6)alkenyl, phenoxy- C_3–C_6(alkynyl), or substituted phenoxy-(C_3–C_6)alkynyl; wherein the phenyl moieties on said substituted phenyl, said substituted phenylalkyl, said substituted phenylalkenyl, said substituted phenylalkylnyl, and said substituted phenoxy may be substituted by one or two moieties selected from the group consisting of fluoro, chloro, bromo, iodo, hydroxy, (C_1–C_3)alkyl, (C_1–C_3)alkoxy and CF_3; R_{11} is (C_1–C_4)alkyl; with the proviso that when R_1 and R_2 are both hydrogen, R_6 cannot be methyl; and with the proviso that when Q is R_1R_2N— and R_1 is hydrogen or (C_1–C_{15})alkyl, R_2 is not hydrogen, (C_1–C_{15})alkyl, cyclopentyl, cyclohexyl, (C_3–C_{15})- alkenyl, phenyl, or (C_7–C_{20})phenylalkyl which may be substituted in the phenyl by one or two of fluoro, chloro, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, or CF_3; and with the proviso that when Q is R_1R_2N—, R_3 and R_4 are not both hydrogen; or a pharmaceutically acceptable acid addition salt thereof, or, when R_6 is (C_2–C_3)alkylcarboxy, a pharmaceutically acceptable base addition salt thereof.

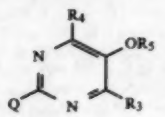
16. A compound of the formula



I

wherein Q is SO_nR_{10}, wherein n is an integer from 0 to 2; R_3 and R_4 are independently selected from the group consisting of hydrogen, (C_1–C_6)alkyl, phenyl, substituted phenyl, (C_7–C_{20})-phenylalkyl, substituted (C_7–C_{20})phenylalkyl, furyl, thienyl, furyl substituted by one (C_1–C_3)alkyl, thienyl substituted by one (C_1–C_3)alkyl, (C_1–C_6)alkyl substituted with carbonyl, chloro, fluoro, bromo, iodo, trifluoromethyl, hydroxy or alkoxy (C_1–C_3), (C_2–C_6)alkenyl, (C_2–C_6)alkynyl, (C_3–C_6)cycloalkyl, (C_1–C_{15})alkyl -(C_3–C_8)cycloalkyl, (C_2–C_{15})alkenyl -(C_3–C_8)-cycloalkyl, or (C_2–C_{15})alkynyl- (C_3–C_8)cycloalkyl; R_5 is —COR_6 —$CH(CH_3)OCOOR_{11}$, —CH_2OCOOR_{11} or R_7; R_6 is hydrogen, (C_1–C_{10}) alkyl, (C_1–C_{10})alkoxy, phenyl, substituted phenyl, (C_7–C_{20})-phenylalkyl, substituted (C_7–C_{20})-phenylalkyl, (C_2–C_3)alkylcarboxy, —NR_8R_9, wherein R_8 and R_9 are independently selected from the group consisting of (C_1–C_{10})alkyl, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl and substituted (C_7–C_{20})phenylalkyl; R_7 is hydrogen or (C_1–C_6)alkyl; R_{10} is (C_5–C_{15})alkyl, (C_5–C_{15})-alkenyl, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl, substituted (C_7–C_{20})-phenylalkyl, (C_7–C_{20})phenylalkyl- (C_7–C_{20})-phenylalkyl, (C_1–C_{17})alkyl- (C_3–C_8)cycloalkyl, (C_2–C_{17})alkenyl-(C_3–C_8-)cycloalkyl, (C_2–C_{17})alkynyl- (C_3–C_8)cycloalkyl, C_5–C_{15})-alkynyl, a heteroaryl containing group selected from heteroaryl(C_1–C_{10})alkyl, heteroaryl- (C_1–C_{10})alkenyl, and heteroaryl-C_1–C_{10})alkynyl, wherein the heteroaryl moiety is selected from the group consisting of thiophene, and furane, (C_7–C_{20})-phenylalkynyl, substituted (C_7–C_{20})phenylalkynyl, (C_1–C_6)alkoxy- (C_4–C_6)alkyl, phenoxy (C_2–C_6)alkyl, substituted phenoxy- (C_2–C_6)alkyl, (C_1–C_6)alkoxy- (C_3–C_6)alkenyl, (C_1–C_6)alkoxy- (C_3–C_6)alkynyl, phenoxy- (C_3–C_6)alkenyl, phenoxy- C_3–C_6(alkynyl), or substituted phenoxy- (C_3–C_6)alkynyl; wherein the phenyl moieties on said substituted phenyl, said substituted phenylalkyl, said substituted phenylalkenyl, said substituted phenylalkylnyl, and said substituted phenoxy may be substituted by one or two moieties selected from the group consisting of fluoro, chloro, bromo, iodo, hydroxy, (C_1–C_3)alkyl, (C_1–C_3)alkoxy and CF_3; and R_{11} is (C_1–C_4)alkyl; or a pharmaceutically acceptable acid addition salt thereof.

19. A compound of the formula



I

wherein Q is R_1R_2N— or SO_nR_{10}, wherein n is an integer from 0 to 2, R_1 is (C_7–C_{20})phenylalkenyl, substituted (C_7–C_{20})-phenylalkenyl (C_7–C_{20})phenylalkenyl, substituted (C_7–C_{20})-phenylalkynyl, (C_1–C_6 alkoxy) - (C_2–C_6)alkyl, phenoxy -(C_2–C_6)-alkyl, substituted phenoxy -(C_2–C_6)alkyl, (C_1–C_6)alkoxy- (C_2–C_6)alkenyl, (C_2–C_6)alkoxy -(C_2–C_6)alkynyl, phenoxy -(C_2–C_6)alkenyl, substituted phenoxy- (C_2–C_6)alkenyl, phenoxy -(C_2–C_6)alkynyl, substituted phenoxy- (C_2–C_6)alkynyl, or (C_7 C_{12})phenylalkyl- (C_7–C_{12})phenylalkyl; R_2 is hydrogen, (C_1–C_{15})alkyl, cyclopentyl, cyclohexyl, (C_3–C_{15})alkenyl, phenyl, substituted phenyl, (C_7–C_{20})phenylalkyl, substituted (C_7–C_{20})phenylalkyl or (C_3–C_8)cycloalkyl -(C_1–C_{15})alkyl; or R_1 and R_2 together with the nitrogen atom to which they are attached form a pyrrolidinyl or piperidyl group which may be substituted by one (C_1–C_6)alkyl, phenyl or (C_7–C_{20}) phenylalkyl; R_3 and R_4 are independently selected from the group consisting of hydrogen, (C_1–C_6)alkyl, phenyl substituted phenyl, (C_7–C_{20})-phenylalkyl, substituted (C_7–C_{20})phenylalkyl, furyl, thienyl, furyl substituted by one (C_1–C_3) alkyl, thienyl substituted by one (C_1–C_3)alkyl, (C_1–C_6)alkyl substituted with carbonyl, chloro, fluoro, bromo, iodo, trifluoromethyl, hydroxy or alkoxy (C_1–C_3), (2–C_6)alkenyl, (2–C_6-)(alkynyl, (C_3–C_6)cycloalkyl, (C_1–C_{15}alkyl-(C_3–C_8 cycloalkyl, (C_2–C_{15})alkenyl - (C_3–C_8)-cycloalkyl, or (C_2–C_{15})alkynyl-(C_3–C_8)cycloalkyl; R_5 is -COR_6 —$CH(CH_3)OCOOR_{11}$, —CH_2OCOOR_{11} or R_7; R_6 is hydrogen, (C_1–C_{10}) alkyl, (C_1–C_{10})alkoxy, phenyl, substituted phenyl, (C_7–C_{20})-phenylalkyl, substituted (C_7–C_{20})phenylalkyl, (C_2–C_3)-alkylcarboxy, —NR_8R_9, wherein R_8 and R_9 are independently selected from the group consisting of (C_1–C_{10})alkyl, phenyl, substituted

phenyl, (C_7–C_{20})phenylalkyl and substituted (C_7–C_{20})phenylalkyl; R_7 is hydrogen or (C_1–C_6)alkyl; R_{10} is (C_5–C_{15})alkyl, (C_5–C_{15})alkenyl, phenyl, substituted phenyl, (C_7–C_{20}) phenylalkyl, substituted (C_7–C_{20})phenylalkyl, (C_7–C_{20})phenylalkyl-(C_7–C_{20})phenylalkyl, (C_1–C_{17})alkyl-(C_3–C_8)cycloalkyl, (C_2–C_{17})alkenyl- (C_3–C_8)cycloalkyl, (C_2–C_{17})alkynyl- (c3–C8)cycloalkyl, (C_5–C_{15})alkynyl, a heteroaryl containing group selected from heteroaryl- (C_1–C_{10})-alkyl, heteroaryl- (C_1–C_1-0)alkenyl, and heteroaryl(C_1–C_{10})alkynyl, wherein the hetero moiety is selected from the group consisting of thiophene, and furane, (C_7–C_{20})-phenylalkenyl substituted (C_7–C_{20})phenylalkyl, (C_7–C_{20})phenylalkynyl, substituted (C_7–C_{20})phenylalkynyl, (C_1–C_6)alkoxy- (C_4–C_6)alkyl, phenoxy- (C_2–C_6)alkyl, substituted phenoxy- (C_2–C_6)alkyl, (C_1–C_6)alkoxy- C_3–C_6)alkenyl, (C_1–C_{60})-alkoxy (C_3–C_6)alkynyl, phenoxy- (C_3–C_6)alkenyl, substituted phenoxy- (C_3–C_6)alkenyl, phenoxy-C_3–C_6(alkynyl), or substituted phenoxy- (C_3–C_6)alkynyl; wherein the phenyl moieties on said substituted phenyl, said substituted phenylalkyl, said substituted phenylalkyl, said substituted phenylalkynyl, and said substituted phenoxy may be substituted by one or two moieties selected from the group consisting of fluoro, chloro, bromo, iodo, hydroxy, (C_1–C_3)alkyl, (C_1–C_3)alkoxy, and CF_3; R_{11} is (C_1–C_4)alkyl; with the proviso that when Q is R_1R_2N—, R_7 is hydrogen and R_3 is (C_1–C_6)alkyl, then R_4 is not hydrogen; and with the proviso that when Q is R_1R_2N—, R_3 and R_4 are not both hydrogen; or a pharmaceutically acceptable acid addition salt thereof, or, when R_6 is (C_2–C_3)alkylcarboxy or R_7 is hydrogen, a pharmaceutically acceptable base addition salt thereof.

4,940,713

SUBSTITUTED GLUTAMIC ACIDS

James L. Kelley, Raleigh, N.C., assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.

Filed Apr. 15, 1988, Ser. No. 181,984

The portion of the term of this patent subsequent to Nov. 14, 2006, has been disclaimed.

Int. Cl.[5] A61K *31/505*; C07D *239/49, 239/36*

U.S. Cl. 514—272 **4 Claims**

1. The compound N-[4-[[4-(2,4-diamino-1,6-dihydro-6-oxo-5-pyrimidinyl)butyl]amino]benzoyl]-(L)-glutamic acid or a pharmaceutically acceptable salt thereof.

4. A pharmaceutically acceptable salt of N-[4-[[4-(2,4-diamino-1,6-dihydro-6-oxo-5-pyrimidinyl)butyl]amino]-benzoyl]-(L)-glutamic acid.

4,940,714

2-SUBSTITUTED CARBONYLIMIDAZO[4,5-C]QUINOLINES

Susumu Takada, Hyogo; Toshio Fujishita, Osaka; Takashi Sasatani, Nara; Akira Matsushita, Hyogo, and Masami Eigyo, Nara, all of Japan, assignors to Shionogi & Co., Ltd., Osaka, Japan

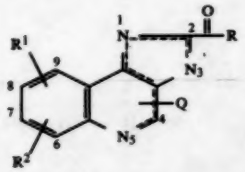
Filed Feb. 14, 1989, Ser. No. 309,868

Claims priority, application Japan, Feb. 16, 1988, 63-33270

Int. Cl.[5] C07D *471/04*; A61K *31/47*

U.S. Cl. 514—293 **8 Claims**

1. A compound of the formula:



(I)

wherein R is (1) hydrogen, (2) C_1–C_{10} alkyl optionally substituted by halogen, C_1–C_5 alkylthio, C_1–C_5 alkyloxycarbonyl, or phenyl, (3) C_3–C_5 cycloalkyl optionally substituted by C_1–C_5 alkyl, (4) C_2–C_5 alkenyl optionally substituted by C_1–C_5 alkyl or di-C_1–C_5 alkyl (5) amino optionally substituted by C_1–C_5 alkyl or di C_1–C_5 alkyl, (6) phenyl optionally substituted by one or two members independently selected from the group consisting of halogen, trifluoromethyl, C_1–C_5 alkoxy, and C_1–C_5 alkylthio, or (7) a isoxazolyl, isothiazolyl, pyrazolyl, oxazolyl, thiazolyl, imidazolyl, oxadiazolyl, thienyl, furyl or pyridyl each optionally substituted by one or two members independently selected from the group consisting of halogen, C_1–C_5 alkyl, and phenyl; Q is hydrogen, C_1–C_5 alkyl, benzyl, benzhydryl, trityl, C_1–C_{13} acyl, C_1–C_5 alkylsulfonyl, or C_6–C_{12} arylsulfonyl, provided that Q is located at the nitrogen atom of the 1-, 3-, or 5-position; R^1 and R^2 each is a hydrogen, C_1–C_5 alkyl, C_1–C_5 alkoxy, or halogen; and the dotted lines indicate the presence of three double bonds at positions 2(3), 3a(9b), 4(5); 1(9b), 2(3), 3a(4); or 1(2), 3a(9b), 4(5); or a pharmaceutically acceptable acid addition salt thereof.

4,940,715

5H-PYRAZOLO[4,3-A] QUINOLIZIN-5-ONE COMPOUNDS EXHIBITING THERAPEUTIC ACTIVITIES

Yoshikazu Kurashina; Hiroshi Miyata, and Den-ichi Momose, all of Matsumoto, Japan, assignors to Kissei Pharmaceutical Co., Ltd., Japan

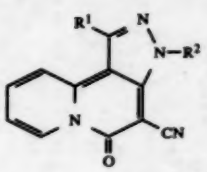
Filed May 10, 1989, Ser. No. 349,778

Claims priority, application Japan, May 17, 1988, 62-120297; May 17, 1988, 63-120298

Int. Cl.[5] C07D *471/06*

U.S. Cl. 514—293 **7 Claims**

1. 5H-pyrazolo[4,3-a]quinolizin-5-one compounds corresponding to the formula:



where R^1 is an alkyl group having 1 to 10 carbon atoms, a phenyl group, or a phenylalkyl group having 7 to 10 carbon atoms; R^2 is a hydrogen atom, an alkyl group having 1 to 3 carbon atoms, a phenyl group, an aliphatic acyl group having 2 to 6 carbon atoms, or a benzoyl group.

4,940,716

2-AMINO-TETRAHYDRO-ISOQUINOLENE DERIVATIVES AND A PROCESS FOR THE PREPARATION THEREOF AND PHARMACEUTICAL COMPOSITIONS CONTAINING SAME

Endre Pálosi; Dezso Korbonits, both of Budapest; Erzsébet Molnár née Bako, Szodliger; Ida Szyoboda née Kaszel, Dunakeszi; László Harsing, Budapest; Gyorgy Simon, Budapest; Vera Gergely, Budapest; Peter Kormoczi, Budapest; Katalin Mármarosi née Keliner, Biatorbagy, and Sandor Virág, Budapest, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt, Budapest, Hungary

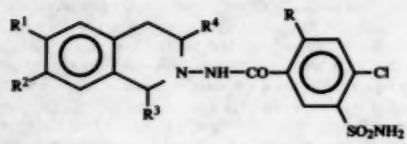
Filed Dec. 29, 1988, Ser. No. 295,920

Claims priority, application Hungary, Dec. 30, 1987, 6132/87

Int. Cl.[5] C07D *217/00*; A61K *31/47*

U.S. Cl. 514—307 **6 Claims**

1. A compound of the Formula (I)



(I)

wherein

R is hydrogen or chlorine

R^1 and R^2 are hydrogen, methoxy or ethoxy, and

R^3 and R^4 are hydrogen or methyl.

6. A diuretic and saluretic pharmaceutical composition which comprises a therapeutically effective amount of the compound of the Formula (I) as defined in claim 1 together with a pharmaceutically acceptable inert carrier.

4,940,717

FUNGICIDAL IMIDAZOLYLMETHYLOXIRANES

Rainer Seele, Fussgoenheim; Stefan Karbach, Neustadt; Bernd Janssen, Ludwigshafen; Reiner Kober, Fussgoenheim; Eberhard Ammermann, Ludwigshafen, and Gisela Lorenz, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

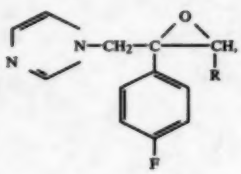
Filed Mar. 6, 1989, Ser. No. 319,318

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807951

Int. Cl.[5] A01N *43/50*; **C07D** *405/06, 405/14*

U.S. Cl. 514—341 **7 Claims**

7. A method for combating fungi, wherein a fungicidally effective amount of an imidazolylmethyloxirane of the formula I



I

where R is phenyl, pyridyl, tetrahydropyranyl, norbornyl, C_3–C_{12}-cycloalkyl or C_5–C_8-cycloalkenyl, these radicals being unsubstituted or substituted by halogen, nitro, phenoxy, alkyl, amino, alkoxy, haloalkoxy or haloalkyl, where alkyl is of 1 to 4 carbon atoms, or a plant-tolerated acid addition salt or metal complex thereof, is allowed to act on the fungi, or on materials, areas, plants or seed threatened by fungus attack.

4,940,718

7-SUBSTITUTED BICYCLIC PYRAZOLIDINONES, PHARMACEUTICAL COMPOSITIONS AND USE

Charles J. Barnett; Richard E. Holmes; Louis N. Jungheim, all of Indianapolis; Sandra K. Sigmund, Carmel, and Robert J. Ternansky, Noblesville, all of Ind., assignors to Eli Lilly and Company, Indianapolis, Ind.

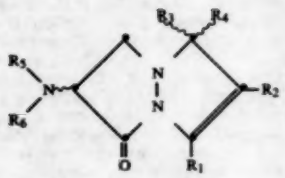
Continuation of Ser. No. 103,488, Sep. 30, 1987, abandoned, which is a continuation-in-part of Ser. No. 862,906, May 14, 1986, abandoned, which is a continuation-in-part of Ser. No. 729,021, Apr. 30, 1985, abandoned. This application Oct. 2, 1989, Ser. No. 418,782

Claims priority, application European Pat. Off., Apr. 28, 1986, 86303174

Int. Cl.[5] A61K *31/425, 31/415*; **C07D** *231/00, 413/12*

U.S. Cl. 514—370 **26 Claims**

1. A com,ound of the formula:



wherein:

either R_1 or R_2 is hydrogen, halo, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, perfluoro C_2 to C_4 alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, nitro or cyano; a group of the formula

wherein X is fluoro, chloro, bromo or iodo;

a group of the formula

wherein Z is 0, 1 or 2 and R_7 is C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_2 to C_7 alkenyl, C_2 to C_7 alkynyl, phenyl, substituted phenyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, or (disubstituted)amino;

a group of the formula

wherein R_8 is hydrogen, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, perfluoro C_2 to C_4 alkyl, trihalomethyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, amino, (monosubstituted-)amino, or (disubstituted)amino;

a group of the formula

wherein R_8 is as defined as above and R_8', is hydrogen, C_1 to C_6 alkyl, C_2 to C_7 alkenyl, C_2 to C_7 alkynyl, phenyl, substituted phenyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl;

a group of the formula

wherein R_9 is hydrogen, an organic or inorganic cation, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, or a non-toxic, metabolically-labile, ester-forming group;

a group of the formula

wherein R_{10} is hydrogen, an organic or inorganic cation, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl-, phenyl, or substituted phenyl;

a group of the formula

wherein R_{11} is hydrogen, C_1 to C_6 alkyl, C_1 to C_6 substi-

tuted alkykl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, or C_1 to C_7 acyl; or a group of the formula

$$-NR_{12}R_{13}$$

wherein R_{12} and R_{13} are the same or different and are hydrogen, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substitutef phenyl, C_1 to C_7 acyl or a group of the formula

wherein R_9 is C_1 to C_6 alkyl, C_7 to C_{12} phenylalkyl or phenyl;

or one of R_{12} and R_{13} is hydrogen and the other is a group of the formula

wherein Nu is (monosubstituted)amino, (disubstituted-)aamino, C_1 to C_6 alkylthio, C_2 to C_7 alkenylthio, C_1 to C_6 substituted alkylthio, phenylalkylthio, C_7 to C_1 phenylalkylthio, or C_7 to C_{12} substituted phenylalkylthio, C_1 to C_6 alkyl alkoxy, C_1 to C_6 substituted alkoxy, l,henoxy, substituted phenoxy, C_7 to C_{12} phenylalkoxy, or C_7 to C_{12} substituted phenylalkoxy;

and the other of R_1 or R_2 is a group, of the formula

$$-COOR_{14}$$

wherein R_{14} is hydrogen, an organic or inorganic cation, or a non-toxic, metabolically-labile ester-forming group;

R_3 and R_4 are the same or different and are hydrogen, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl or a group of the formula

$$-COOR_{15}$$

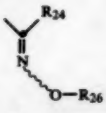
wherein R_{15} has the same definition as R_9;

R_5 is hydrogen;

R_6 is an acyl group of the formula

$$-COR_{16},$$

wherein R_{16} is a group of the formula



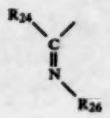
wherein R_{26} is hydrogen, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_2 to C_7 alkenyl, C_2 to C_7 alkynyl, C_3 to C_7 cycloalkyl, C_3 to C_7 substituted cycloalkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl or substituted phenyl; and R_{24} is 2-aminothiazol-4-yl; or a pharmaceutically-acceptable salt thereof.

21. A pharmaceutical composition useful for the control of gram-positive and gram-negative bacterial infections, comprising an antibacterially-effective amount of a compound of claim **1**, wherein:

R_9 is hydrogen, an organic or inorganic cation, C_1 to C_6 alkyl, C_1 to C_6 substituted alkyl, C_7 to C_{12} phenylalkyl, C_7 to C_{12} substituted phenylalkyl, phenyl, substituted phenyl, or a non-toxic, metabolically-labile ester-forming group;

R_{14} is hydrogen, an organic or inorganic cation or a non-toxic, metabolically-labile ester-forming group; and

R_5 is hydrogen and R_6 is



excluding any protected hydroxy groups, protected amino groups and protected carboxy groups.

4,940,719

TETRAHYDROCARBAZOLE ESTERS, PHARMACEUTICAL COMPOSITIONS AND USE

John W. Gillard, Baie d'Urfe; Christiane Yoakim; Yvan Guindon, both of Montreal, and Yves Girard, Bizard, all of Canada, assignors to Merck Frosst Canada, Inc., Kirkland, Canada

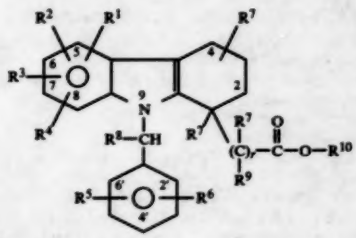
Continuation-in-part of Ser. No. 1,711, Jan. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 845,207, Mar. 27, 1986, abandoned. This application Sep. 28, 1987, Ser. No. 101,611

The portion of the term of this patent subsequent to Feb. 28, 2006, has been disclaimed.

Int. Cl.[5] **A61K** *31/395, 31/41;* **C07D** *209/82, 403/02*

U.S. Cl. 514—381 **14 Claims**

1. A compound of the formula:



I

wherein:

R^1, R^2, R^3, R^4, R^5 and R^6 are each independently selected from:

(1) hydrogen;

(2) alkyl having 1 to 6 carbons;

(3) alkenyl having 2 to 6 carbons;

(4) $-(CH_2)_nM$ wherein M is

(a) OR^{11};

(b) halogen;

(c) CF_3;

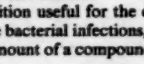
(d) SR^{11};

(e) phenyl or substituted phenyl;

(f) $COOR^{12}$;

(g) ;

(h) tetrazole;

(i)  ;

(j) $-NR^{12}R^{12}$;

(k) $-NHSO_2R^{15}$;

(l) ;

(m) $-SOR^{11}$;
(n) $-CONR^{12}R^{12}$;
(o) $-SO_2NR^{12}R^{12}$;
(p) $-SO_2R^{11}$;
(q) NO_2;

(r) ;

(s) ;

(t) ;

(u) CN; or
(v) N_3;

provided that when R^1, R^2, R^3 or R^4 is alkyl having 1 to 6 carbons, it is not located at position 6; provided that at least one of R^5 or R^6 is M wherein M is

(d) SR^{11};
(m) $-SOR^{11}$;
(o) $-SO_2NR^{12}R^{12}$; or
(p) $-SO_2R^{11}$;

R^7 is H or alkyl of 1 to 6 carbons;
R^8 is H or alkyl of 1 to 6 carbons;
each R^9 is independently H, OH, C_1 to C_4-O-alkyl, or alkyl of 1 to 4 carbons;
R^{10} is lower alkyl, substituted or unsubstituted 2-phenethyl, substituted or unsubstituted benzyl, or substituted or unsubstituted phenyl;
each R^{11} is independently H, C_1 to C_6 alkyl, benzyl, phenyl, or substituted phenyl;
each R^{12} is independently H, phenyl, benzyl, or C_1 to C_6 alkyl;
each R^{13} is independently H, $(CH_2)_mCOOR^{12}$, C_1 to C_6 alkyl, CF_3, phenyl, or substituted phenyl;
each R^{14} is independently C_1 to C_6 alkyl, benzyl, or phenyl;
each R^{15} is independently C_1 to C_6 alkyl, 4-methylphenyl, phenyl, or CF_3;
m is 0 to 4;
n is 0 to 3; and
r is 1 to 6;

or a pharmaceutically acceptable salt thereof.

10. A pharmaceutical composition for inhibiting leukotriene synthesis and antagonizing prostaglandins in mammals comprising an effective amount of a compound of claim **1** or a pharmaceutically acceptable salt thereof, and a pharmaceutically acceptable carrier.

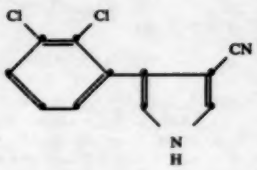
4,940,720

MICROBICIDAL COMPOSITIONS

David J. Nevill, Rieben, and Bernhard Steck, Muntelier, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

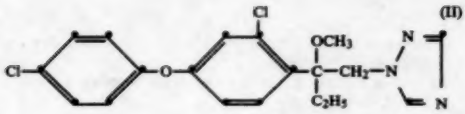
Filed Aug. 2, 1989, Ser. No. 388,782
Int. Cl.[5] A01N *43/36, 43/64*
U.S. Cl. 514—383 **4 Claims**

1. A fungicidal composition for plants containing a synergistic fungicidally effective amount of the mixture of at least two active ingredient components, wherein one component (I) is 3-cyano-4-(2,3-dichlorophenyl)-pyrrole of formula I



(I)

and the other component (II) is 1-(1H-1,2,4-triazol-1-yl)-2-methoxy-2-[4-(4-chlorophenoxy)-2-chlorophenyl]-butane of formula II



(II)

or a salt thereof, together with a carrier, wherein the weight ratio of I:II is 20:1 to 1:20.

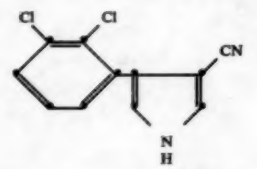
4,940,721

MICROBICIDAL COMPOSITIONS

David J. Nevill, Rieben, and Bernhard Steck, Muntelier, both of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

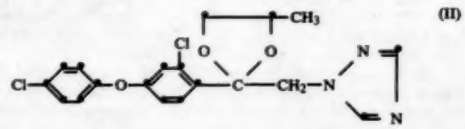
Filed Jul. 31, 1989, Ser. No. 388,177
Claims priority, application Switzerland, Aug. 4, 1988, 2960/88
Int. Cl.[5] A01N *43/36, 43/64*
U.S. Cl. 514—383 **4 Claims**

1. A fungicidal composition for plants containing a synergistic fungicidally effective amount of the mixture of at least two active ingredient components, wherein one component (I) is 3-cyano-4-(2,3-dichlorophenyl)-pyrrole of formula I



(I)

and the other component (II) is 1-{2-[2-chloro-4-(4-chlorophenoxy)-phenyl]-4-methyl-1,3-dioxolan-2-ylmethyl}-1H-1,2,4-triazole of formula II



(II)

or a salt thereof, together with carrier, wherein the weight ratio of I:II is 20:1 to 1:20.

4,940,722

SEED DISINFECTANT COMPOSITION

Hirotaka Takano, Nishinomiya, Japan, assignor to Sumitomo Chemical Company, Limited, Osaka, Japan

Filed Nov. 17, 1987, Ser. No. 122,858
Claims priority, application Japan, Dec. 10, 1986, 61-293771
The portion of the term of this patent subsequent to Oct. 21, 2003, has been disclaimed.
Int. Cl.[5] A01N *43/52, 43/64*
U.S. Cl. 514—383 19 Claims

1. A seed disinfectant composition comprising fungicidally effective amounts of

(A) (E)-1-(2,4-dichlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol containing not less than 66.5% by weight of (−)-(E)-1-(2,4-dichlorophenyl)-4,4-dimethyl-2-(1,2,4-triazol-1-yl)-1-penten-3-ol and

(B) at least one benzimidazole thiophanate fungicide, wherein the weight ratio of (A):(B) is 1-50:1-50.

4,940,723

USE OF BIS-(5-AMIDINO-2-BENZIMIDAZOLYL) METHANE (BABIM) TO TREAT ARTHRITIS

Richard R. Tidwell; Joachim D. Geratz; John H. Schwab; Katherine B. Pryzwansky, and Sonia K. Anderle, all of Chapel Hill, N.C., assignors to University of North Carolina, Chapel Hill, Chapel Hill, N.C.

Filed Oct. 20, 1988, Ser. No. 260,056
Int. Cl.[5] A61K *31/415*
U.S. Cl. 514—396 8 Claims

1. A method of treating arthritis which comprises administering to a patient having arthritis, an arthritis treating effective amount of bis-(5-amidino-2-benzimidazolyl)methane and a pharmaceutically acceptable carrier.

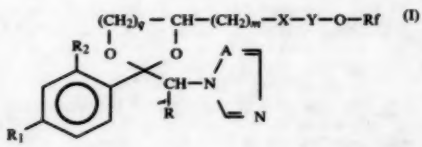
4,940,724

AZOLYL-DERIVATIVES HAVING FUNGICIDAL ACTIVITY

Roberto Colle; Giuseppina Ratti; Carlo Garavaglia, and Luigi Mirenna, all of Milan, Italy, assignors to Istituto Guido Donegani S.p.A., Novara, Italy

Division of Ser. No. 74,352, Jul. 16, 1987, Pat. No. 4,810,718.
This application Feb. 14, 1989, Ser. No. 310,338
Claims priority, application Italy, Jul. 21, 1986, 21194 A/86
Int. Cl.[5] A01N *43/50*; C07D *405/06*
U.S. Cl. 514—397 3 Claims

1. A compound having the formula:



wherein:

m=1 or 2;

q=1 or 2;

y=a haloethylene or haloethenyl(ene) group;

X=is oxygen or sulphur;

A=CH;

R=is H, CH_3 or F;

R_1 is selected from the group consisting of chlorine, bromine, fluorine, CF_3, phenyl, C_1–C_2 alkoxy, C_1–C_2 haloalkoxy;

R_2 is selected from the group consisting of H, chlorine, bromine and fluorine; and

R_f is a C_1–C_5 polyfluoroalkyl or C_2–C_4 polyfluoroalkenyl radical containing at least 3 fluorine atoms.

4,940,725

OXINDOLE ALKALOIDS HAVING PROPERTIES STIMULATING THE IMMUNOLOGIC SYSTEM AND PREPARATION CONTAINING THE SAME

Klaus Keplinger, Müllerstrasse 30, A-6020 Innsbruck, Austria; Hildeber Wagner, Breitbrunn am Chiemsee, and Barbara Kreutzkamp, Munich, both of Fed. Rep. of Germany, assignors to Klaus Keplinger, Innsbruck, Austria

Continuation of Ser. No. 195,458, May 16, 1988, Pat. No. 4,844,901, which is a continuation of Ser. No. 684,154, Dec. 20, 1984, abandoned, which is a continuation-in-part of Ser. No. 463,512, Feb. 3, 1983, abandoned, which is a continuation-in-part of Ser. No. 195,051, Oct. 14, 1980, abandoned. This application Apr. 3, 1989, Ser. No. 333,846
Claims priority, application Austria, Oct. 7, 1980, 4971/80
Int. Cl.[5] A61K *31/40, 31/35*
U.S. Cl. 514—411 24 Claims

1. A pharmaceutical agent for stimulating the immunological system comprising oxindole alkaloids with the formula $C_{21}H_{24}O_4N_2$, derived from Uncaria tomentosa (WILLD.) DC. of the order of Gentianales having a yellow-brown or dark red fresh bast and substantially free from tannin substances, said oxindole alkaloids being selected from the group consisting of isopteropodine and pteropodine, wherein at least one of said oxindole alkaloids is further complexed with a catechine to form an alkaloid-catechine complex.

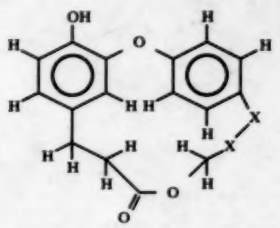
4,940,726

CELL GROWTH INHIBITORY MACROCYCLIC LACTONES DENOMINATED COMBRETASTATIN D-1 AND COMBRETASTATIN D-2

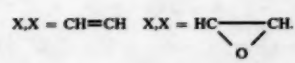
George R. Pettit, Paradise Valley, and Sheo B. Singh, Tempe, both of Ariz., assignors to Arizona Board of Regents, Tempe, Ariz.

Filed Apr. 26, 1989, Ser. No. 344,005
Int. Cl.[5] A61K *31/365*; C07B *321/00*
U.S. Cl. 514—450 9 Claims

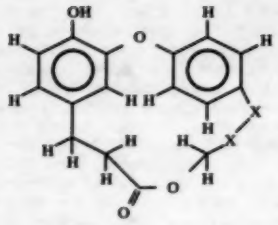
1. A cell growth inhibitory macrocyclic lactone having the structural formula:



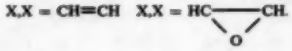
wherein:



4. The method of treating a host afflicted with a neoplastic disease characterized by uncontrolled cell growth comprising administering to said host a pharmaceutical preparation containing a pharmacologically acceptable carrier and, as its essential active cell growth inhibitory substance a therapeutically active amount of a macrocyclic lactone having the structural formula:



wherein:



4,940,727

NOVEL HMG-COA REDUCTASE INHIBITORS

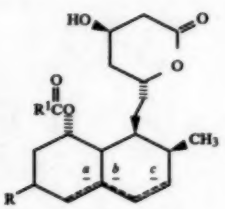
Edward S. Inamine, Rahway; Otto D. Hensens, Red Bank, both of N.J.; David R. Houck, Los Alamos, N. Mex.; Ta J. Lee; Robert L. Smith, both of Lansdale; Wasyl Halczenko, Hatfield; George D. Hartman, Lansdale, and Gerald E. Stokker, Gwynedd Valley, all of Pa., assignors to Merck & Co., Inc., Rahway, N.J.

Continuation-in-part of Ser. No. 92,353, Sep. 2, 1987, abandoned, and Ser. No. 48,136, May 15, 1987, abandoned, which is a continuation-in-part of Ser. No. 1,933, Oct. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 877,041, Jun. 23, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 254,525

Int. Cl.[5] A61K *31/335;* **C07D** *315/00*

U.S. Cl. 514—450 **25 Claims**

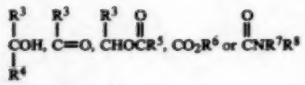
1. A compound represented by the following structural formula (I):



(I)

wherein:

R is



R^1 and R^5 are independently:

(1) C_{1-10} alkyl;

(2) substituted C_{1-10} alkyl in which one or more substituent(s) is:

(a) halogen,

(b) hydroxy,

(c) C_{1-10} alkoxy,

(d) C_{1-5} alkoxycarbonyl,

(e) C_{1-5} acyloxy,

(f) C_{3-8} cycloalkyl,

(g) phenyl,

(h) substituted phenyl in which the substituents are X and Y,

(i) C_{1-10} alkylS(O)$_n$ in which n is 0 to 2,

(j) C_{3-8} cycloalkylS(O)$_n$,

(k) phenylS(O)$_n$,

(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(m) oxo;

(3) C_{1-10} alkoxy;

(4) C_{2-10} alkenyl;

(5) C_{3-8} cycloalkyl;

(6) substituted C_{3-8} cycloalkyl in which one substituent is:

(a) C_{1-10} alkyl

(b) substituted C_{1-10} alkyl in which the substituent is selected from

(i) halogen,

(ii) hydroxy,

(iii) C_{1-10} alkoxy,

(iv) C_{1-5} alkoxycarbonyl,

(v) C_{1-5} acyloxy,

(vi) phenyl,

(vii) substituted phenyl in which the substituents are X and Y

(viii) C_{1-10} alkylS(O)$_n$,

(ix) C_{3-8} cycloalkylS(O)$_n$,

(x) phenylS(O)$_n$,

(xi) substituted phenylS(O)$_n$ in which the substituents are X and Y, and

(xii) oxo,

(c) C_{1-10} alkylS(O)$_n$,

(d) C_{3-8} cycloalkylS(O)$_n$,

(e) phenylS(O)$_n$,

(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,

(g) halogen,

(h) hydroxy,

(i) C_{1-10} alkoxy,

(j) C_{1-5} alkoxycarbonyl,

(k) C_{1-5} acyloxy,

(l) phenyl, and

(m) substituted phenyl in which the substituents are X and Y;

(7) phenyl;

(8) substituted phenyl in which the substituents are X and Y;

(9) amino;

(10) C_{1-5} alkylamino;

(11) di(C_{1-5} alkyl)amino;

(12) phenylamino;

(13) substituted phenylamino in which the substituents are X and Y;

(14) phenyl C_{1-10} alkylamino;

(15) substituted phenyl C_{1-10} alkylamino in which the substituents are X and Y; and R^9S in which R^9 is selected from

(a) C_{1-10} alkyl,

(b) phenyl, and

(c) substituted phenyl in which the substituents are X and Y;

R^6 are independently:

(1) hydrogen;

(2) C_{1-5} alkyl;

(3) substituted C_{1-5} alkyl in which the substituent is:

(a) phenyl,

(b) dimethylamino, and

(c) acetylamino, and

(4) 2,3-dihydroxypropyl;

R^3 and R^4 are independently:

(1) hydrogen;

(2) C_{1-10} alkyl;

(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:

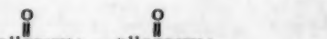
(a) halogen,

(b) hydroxy,

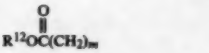
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkylS(O)$_n$,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) substituted C_{2-10} alkenyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-5} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkylS(O)$_n$,
(j) C_{3-8} cycloalkylS(O)$_n$,
(k) phenylS(O)$_n$,
(l) substituted phenylS(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(6) C_{3-8} cycloalkyl;
(7) substituted C_{3-8} cycloalkyl in which one substituent is:
(a) C_{1-10} alkyl
(b) substituted C_{1-10} alkyl in which the substituent is
(i) halogen,
(ii) hydroxy,
(iii) C_{1-10} alkoxy,
(iv) C_{1-5} alkoxycarbonyl,
(v) C_{1-5} acyloxy
(vi) phenyl,
(vii) substituted phenyl in which the substituents are X and Y
(viii) C_{1-10} alkylS(O)$_n$,
(ix) C_{3-8} cycloalkylS(O)$_n$,
(x) phenylS(O)$_n$ in which the substituents are X and Y, and
(xii) oxo,
(c) C_{1-10} alkylS(O)$_n$,
(d) C_{3-8} cycloalkylS(O)$_n$,
(e) phenylS(O)$_n$,
(f) substituted phenylS(O)$_n$ in which the substituents are X and Y,
(g) halogen,
(h) hydroxy,
(i) C_{1-10} alkoxy,
(j) C_{1-5} alkoxycarbonyl,
(k) C_{1-5} acyloxy,
(l) phenyl, and
(m) substituted phenyl in which the substituents are X and Y;
(8) phenyl;
(9) substituted phenyl in which the substituents are X and Y;

R^7 and R^8 are independently:
(1) hydrogen;
(2) C_{1-10} alkyl;
(3) substituted C_{1-10} alkyl in which one or more substituent(s) is:
(a) halogen,
(b) hydroxy,
(c) C_{1-10} alkoxy,
(d) C_{1-10} alkoxycarbonyl,
(e) C_{1-5} acyloxy,
(f) C_{3-8} cycloalkyl,
(g) phenyl,
(h) substituted phenyl in which the substituents are X and Y,
(i) C_{1-10} alkyl S(O)$_n$ in which n is 0 to 2,
(j) C_{3-8} cycloalkyl S(O)$_n$,
(k) phenyl S(O)$_n$;
(l) substituted phenyl S(O)$_n$ in which the substituents are X and Y, and
(m) oxo;
(4) C_{2-10} alkenyl;
(5) C_{3-8} cycloalkyl;
(6) aminocarbonyl;
(7) substituted aminocarbonyl in which one or more substituent(s) is:
(a) C_{1-5} alkyl,
(b) C_{3-8} cycloalkyl,
(c) phenyl,
(d) substituted phenyl in which the substituents are X and Y;
(8) phenyl;
(9) substituted phenyl in which the substituents are X and Y;
(10) C_{1-10} alkylcarbonyl;
(11) C_{3-8} cycloalkylcarbonyl;
(12) phenylcarbonyl;
(13) substituted phenylcarbonyl in which the substituents are X and Y; and

X and Y independently are hydrogen, halogen, trifluoromethyl, C_{1-3} alkyl, nitro, cyano or a group selected from:
(1) $R^{10}O(CH_2)_m$ in which m is 0 to 3 and R^{10} is hydrogen, C_{2-3}alkyl or hydroxy C_{2-3}alkyl;
(2)



in which R^{11} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, phenyl, naphthyl, amino C_{1-3}alkyl, C_{1-3}alkylamino-C_{1-3}alkyl, di(C_{1-3}alkyl)amino-C_{1-3}alkyl, hydroxy C_{2-3} alkylamino-C_{1-3}alkyl or di(hydroxy C_{2-3}alkyl) amino C_{1-3}alkyl;
(3)



in which R^{12} is hydrogen, C_{1-3}alkyl, hydroxy-C_{2-3}alkyl, C_{1-3}alkoxy-C_{1-3}alkyl, phenyl or naphthyl;
(4)

in which R^{13} and R^{14} independently are hydrogen, C_{1-3} alkyl, and hydroxy-C_{2-3}alkyl;
(5) $R^{15}S(O)_n(CH_2)m$ in which R^{15} is hydrogen, C_{1-3}alkyl, amino, C_{1-3}alkylamino or di(C_{1-3}alkyl)amino; and

a, b and c each represent single bonds or one of a, b and c represents a double bond or both a and c represent double bonds; or a pharmaceutically acceptable salt thereof.

4,940,728
TREATMENT FOR SINO-NASAL CONGESTION
John E. Postley, 17 E. 89th St., New York, N.Y.
Filed May 17, 1985, Ser. No. 735,482
Int. Cl.[5] A61K *31/34*
U.S. Cl. 514—474 5 Claims

1. A method of treating sino-nasal congestion, viral nasopharyngitis, allergic rhinitis, and related conditions associated with nasal congestion comprising applying to the nasal mucosa a solution comprising ascorbic acid, a pharmaceutically acceptable salt or ester of ascorbic acid, or combinations thereof dissolved in a pharmaceutically acceptable liquid carrier in an amount effective to treat sino-nasal congestion.

4,940,729
PESTICIDAL FORMULATIONS
Michael D. Matthewson, Berkhamsted, England, assignor to Burroughs Wellcome Co., Research Triangle Park, N.C.
Continuation of Ser. No. 251,103, Apr. 6, 1981, abandoned, which is a continuation of Ser. No. 43,491, May 29, 1979, abandoned. This application Jan. 8, 1986, Ser. No. 817,786
Claims priority, application United Kingdom, May 30, 1978, 7824264; May 30, 1978, 7824265
Int. Cl.[5] A01N *53/00, 37/34*
U.S. Cl. 514—521 4 Claims

1. A pesticidal composition comprising permethrin and cypermethrin in an amount of 1 to 1 by weight.

4,940,730
ANGIOGENESIS ENHANCER
Kaori Wakamatsu, Tsukuba; Koichi Kondo, Sohraku, and Katsuichi Sudo, Takatsuki, all of Japan, assignors to Takeda Chemical Industries, Ltd., Osaka, Japan
Filed Oct. 3, 1988, Ser. No. 253,060
Claims priority, application Japan, Oct. 29, 1987, 62-274461; Jul. 7, 1988, 63-169763
Int. Cl.[5] A61K *31/16, 31/20*
U.S. Cl. 514—560 4 Claims

1. [The] A composition [according to claim 10, wherein] with enhanced angiogenic activity which contains an effective amount of the compound [is] erucamide[.], together with a physiologically acceptable carrier, excipient, or diluent therefor.

4,940,731
METHOD OF TREATING PREMATURE EJACULATION USING SERTRALINE
Peter A. Bick, Hartsdale, N.Y., assignor to Pfizer Inc., New York, N.Y.
Filed Aug. 30, 1989, Ser. No. 400,417
Int. Cl.[5] A61K *31/135*
U.S. Cl. 514—657 1 Claim

1. A method of treating premature ejaculation, comprising administering to a patient in need of such treatment an amount of the compound (1S-cis)-4-(3,4-dichlorophenyl)-1,2,3,4-tetrahydro-N-methyl-1-naphthalenamine, or a pharmaceutically acceptable salt thereof, effective in delaying ejaculation.

4,940,732
DISPERSIONS AND THE PREPARATION OF FOAMED RESINS THEREFROM
Ronald L. Pastorino, Larkspur, and Lawrence A. Bock, Walnut Creek, both of Calif., assignors to Witco Corporation, New York, N.Y.
Division of Ser. No. 293,890, Jan. 5, 1989, Pat. No. 4,892,854. This application Nov. 30, 1989, Ser. No. 443,932
Int. Cl.[5] C08J *9/08*
U.S. Cl. 521—69 9 Claims

1. The method for making a foamed polyester resin by curing and crosslinking unsaturated polyester resin and expanding the resin into a cellular structure with a gas, the improvement which comprises incorporating into the resin an aqueous dispersion comprising a symmetrical or asymmetrical aromatic diacyl peroxide; an alkali metal carbonate or bicarbonate or mixtures thereof; dispersion stabilizing amounts of magnesium aluminum silicate and alkali metal carboxymethyl cellulose; glycerol; and sufficient water to form an aqueous dispersion in an amount sufficient to effect curing and forming of the resin.

4,940,733
METHOD FOR FOAMING HIGH TEMPERATURE POLYMERS USING POLY(ALKYLENE CARBONATES) AS FOAMING AGENTS
Jeffrey A. Kuphal, Blandon; Lloyd M. Robeson, Macungie, and Joseph G. Santangelo, Allentown, all of Pa., assignors to Air Products and Chemicals, Inc., Allentown, Pa.
Filed Nov. 28, 1989, Ser. No. 442,107
Int. Cl.[5] C08J *9/08, 9/02*
U.S. Cl. 521—79 20 Claims

1. A process for producing a foamed article from a polymer capable of being foamed which comprises:

mixing a first polymer capable of being foamed is selected from the group consisting of polysulfone, poly(ether sulfone), poly(aryl sulfone), poly(aryl ether sulfone), poly(etherimide), poly(amide-imide), poly(aryl ether ketone), modified poly(phenylene ether), amorphous polyamides and poly(phenyl sulfide) and copolymers and terpolymers as well as blends of the above mentioned polymers with a second polymer comprising a homopolymer or copolymer of propylene carbonate or a blend of the propylene carbonate polymer with at least one other alkylene carbonate polymer to provide a polymer blend;

(b) heating the polymer blend to a temperature sufficient to melt the polymer to be foamed and to decompose the second polymer to form gas inclusions within the first polymer;

(c) expanding the melted first polymer containing the gas inclusions to form a foamed article; and

(d) cooling the foamed article to a temperature below the melting or softening point of the foamed article.

4,940,734
PROCESS FOR THE PREPARATION OF POROUS POLYMER BEADS
David A. Ley, New Canaan; Laura J. Hiscock, Norwalk, both of Conn., and Michael T. Cooke, New York, N.Y., assignors to American Cyanamid, Me.
Filed Nov. 23, 1988, Ser. No. 275,170
Int. Cl.[5] C08J *9/28*
U.S. Cl. 521—84.1 20 Claims

1. A process for the preparation of porous polymer beads with controllable surface porosity wherein said beads are substantially nonswellable in water and have substantially uniform pores of not substantially greater than about 5 microns in diameter, said process comprising

(i) heating and mixing an acrylonitrile homopolymer or copolymer thereof with a mixture comprising a solvent and a non-solvent for the polymer to form a homogeneous solution having a polymer solids concentration range of from 0.5 to less than 20 percent:

(ii) breaking the homogeneous solution into droplets using a high shearing technique;

(iii) cooling the droplets, optionally in the presence of an inert liquid, to bring about phase separation and solidification of the polymer in the droplets;

(iv) separating the solidified droplets from any inert liquid and removing the solvent non-solvent mixture from the solidified droplets to produce porous beads.

4,940,735

BLOWING AGENT MASTERBATCH FOR THE PREPARATION OF POLYSTYRENE FOAMS

Gerhard Kress, Ludwigshafen, Fed. Rep. of Germany, assignor to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Mar. 23, 1989, Ser. No. 327,928
Claims priority, application Fed. Rep. of Germany, Mar. 26, 1988, 3810342
Int. Cl.[5] C08J 9/08
U.S. Cl. 521—86 3 Claims

1. A blowing agent masterbatch for the preparation of polystyrene foams, comprising:

(a) from 30 to about 80 weight percent of a plasticizer-containing polystyrene having a Vicat softening temperature between 30° and 50° C.;

(b) from 20 to about 70 weight percent of a blowing agent comprising solid organic acids and alkali metal (bi) carbonates; and optionally

(c) from 10 to about 20 weight percent of a cell regulator.

4,940,736

PRODUCTION OF LOW DENSITY POLYPROPYLENE FOAM

Josef Alteepping, Ochtrup, Fed. Rep. of Germany, and Juergen P. Nebe, Naperville, Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Sep. 12, 1988, Ser. No. 243,831
Int. Cl.[5] C08J 9/14
U.S. Cl. 521—98 25 Claims

1. A method of producing a foamed product having a density less than 0.2 g/cm^3 which comprises foaming a composition comprising a major proportion of a low viscosity polypropylene component having a melt viscosity (at 190° C. and a shear rate of 1000 sec^{-1}) of less than 2×10^3 poise and a minor proportion of a high viscosity polypropylene component having a melt viscosity (at 190° C. and a shear rate of 1000 sec^{-1}) of greater than 2.5×10^3 poise.

4,940,737

CHEMICALLY MODIFIED HYDROPHILIC PREPOLYMERS AND POLYMERS

James A. Braatz, Beltsville; Aaron H. Heifetz, Columbia, both of Md.; Richard A. Wolfe, Ellisville, Mo., and Narender P. Luthra, Columbia, Md., assignors to W. R. Grace & Co.-Conn, New York, N.Y.

Filed Nov. 2, 1988, Ser. No. 266,445
Int. Cl.[5] C08G 18/14
U.S. Cl. 521—103 32 Claims

1. A modified hydrophilic prepolymer derived from prepolymer units which are oxyethylene-based alcohols having essentially all of the hydroxyl groups capped with polyisocyanate, wherein said prepolymer units have been modified by reaction with either

(1) a modifying compound having a first functional group which is (i) a sulfhydryl group under conditions which form a thiolate anion (ii) a hydroxyl group, or (iii) an amino group contained in a monoamine compound, and having a second functional group which is substantially less isocyanate-reactive than said first functional group, such that at least a portion of the isocyanate groups of said prepolymer are modified, or

(2) a modifying compound having a first functional group which is a carboxyl group or an amino group contained in a diamine or polyamine compound, and a second functional group which is substantially less isocyanate-reactive than said first functional group, such that substantially all of the isocyanate groups of said prepolymer are modified.

4,940,738

HIGH SOLIDS CB PRINTING INK CONTAINING A PROTECTIVE COLLOID BLEND

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Continuation of Ser. No. 141,632, Jan. 7, 1988, Pat. No. 4,889,877. This application Aug. 11, 1989, Ser. No. 392,478
The portion of the term of this patent subsequent to Dec. 26, 2006, has been disclaimed.
Int. Cl.[5] C09D 5/00
U.S. Cl. 523—161 12 Claims

1. A high solids content, aqueous, microcapsule-containing printing ink, comprising:

an aqueous solution containing water and a non-volatile diluent,

oil-containing microcapsules dispersed in said aqueous solution, and

a protective colloid blend dispersed in said aqueous solution, said protective colloid blend comprising a blend of hard, brittle, poor film-forming resin with soft, pliable, film-forming resin.

4,940,739

PROCESS FOR MAKING A HIGH SOLIDS CB PRINTING INK

Michael E. A. Seitz, Dayton, Ohio, assignor to The Standard Register Company, Dayton, Ohio

Division of Ser. No. 141,623, Jan. 7, 1988, Pat. No. 4,889,877. This application Dec. 27, 1988, Ser. No. 289,749
Int. Cl.[5] C09D 5/00
U.S. Cl. 523—161 11 Claims

1. A process for making a high solids content, aqueous, microcapsule-containing printing ink, comprising:

preparing an oily solution having dissolved therein a reactant,

dispersing said oily solution into an aqueous solution in the presence of a coreactant to form an emulsion, said aqueous solution containing water and a non-volatile diluent, said non-volatile diluent being soluble in water, immiscible in said oily solution, non-reactive with said reactant and coreactant, having a low viscosity, and being present in an amount ranging from 12–25% by weight of said printing ink, and

reacting reactant and said coreactant in said emulsion to form a hard thick capsule wall around droplets of oily solution and thereby produce microcapsule,

whereby said microcapsules are dispersed in said aqueous solution to form said printing ink.

4,940,740

SINGLE PHASE TOUGHENED HEAT-CURABLE RESIN SYSTEMS EXHIBITING HIGH STRENGTH AFTER IMPACT

Thomas Folda, Neuleiningen, and Thomas Allspach, Bad Dürkheim, both of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Apr. 21, 1989, Ser. No. 341,479
Int. Cl.[5] C08G 59/24; C08J 5/24
U.S. Cl. 523—428 18 Claims

1. A heat-curable resin system, comprising:

(a) from 10 to about 80 weight percent of an epoxy resin component;

(b) from 10 to about 50 weight percent of a prereact component; and

(c) from 0.8 to about 1.6 equivalents, based upon the epoxy groups in components (a) and (b), of an aromatic diamine curing agent;

wherein said prereact component (b) is the essentially phenolic hydroxyl-free reaction product of an epoxy resin and a diphenol; wherein the molecular weight of component (b) is such that phase separation does not result upon cure of the heat-curable resin system; and wherein all percents of (a) and (b) are

percents by weight relative to the total weight of components (a), (b), and (c).

4,940,741

PROCESS FOR THE PRODUCTION OF HARDBOARD

Dennis R. De Wacker, Belle Mead, and Leon Rosenberg, Bridgewater, both of N.J., assignors to National Starch and Chemical Investment Holding Corporation, Wilmington, Del.

Filed Jun. 17, 1988, Ser. No. 208,949

Int. Cl.[5] C08L *3/02, 3/10*

U.S. Cl. 524—47 **16 Claims**

1. A one step process for simultaneously compressing and tempering a fiberboard panel, which comprises the step of applying to the panel prior to compression thereof an aqueous treating composition which consists essentially of (a) a polyvinyl acetate emulsion, characterized in that the emulsion is prepared in the presence of about 6–10% by weight of a starch stabilizer selected from the group consisting of a derivatized starch, a converted starch, and a derivatized and converted starch and 0.5–1.5% of a surfactant, the stabilizer and surfactant percentages being by weight based on the total weight of the monomers, (b) up to 40% of a hydrocarbon emulsion, and (c) up to 5% of a crosslinking agent, the percentage of (b) and (c) being by weight of the treating composition and totaling 100%.

4,940,742

2,6-POLYALKYLPIPERIDINE-SUBSTITUTED BENZIMIDAZOLE-2-CARBOXANILIDES AND THEIR USE FOR STABILIZING ORGANIC MATERIAL

Alexander Aumueller, Deidesheim; Peter Spang, St. Ingbert; Peter Neumann, Mannheim, and Hubert Trauth, Dudenhofen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

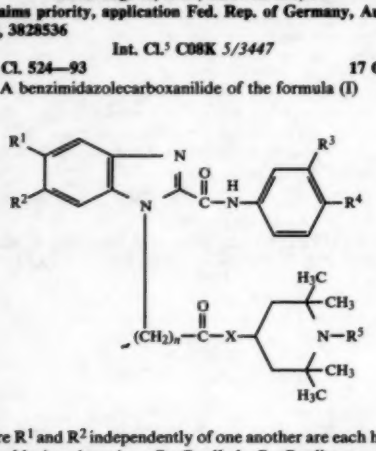
Filed Aug. 11, 1989, Ser. No. 392,598

Claims priority, application Fed. Rep. of Germany, Aug. 23, 1988, 3828536

Int. Cl.[5] C08K *5/3447*

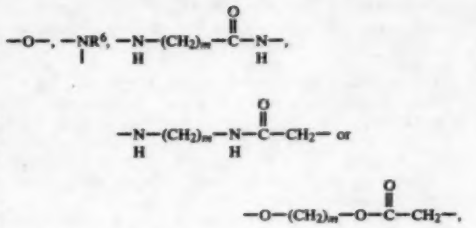
U.S. Cl. 524—93 **17 Claims**

1. A benzimidazolecarboxanilide of the formula (I)



(I)

where R^1 and R^2 independently of one another are each hydrogen, chlorine, bromine, C_1–C_4-alkyl, C_1–C_4-alkoxy, phenyl which is unsubstituted or substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, or C_7–C_9-phenylalkyl which is substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, R^3 and R^4 independently of one another are each hydrogen, C_1–C_{18}-alkyl, C_3–C_{18}-alkyl which is interrupted by one or more oxygen atoms, C_1–C_{18}-alkoxy, C_4–C_{18}-alkoxy which is interrupted by one or more oxygen atoms, phenyl which is unsubstituted or substituted by C_1–C_4-alkyl or C_1–C_4-alkoxy, or phenyl-C_1–C_8-alkoxy, C_1–C_{12}-C-acylamino, benzoylamino, C_2–C_{12}-C-acyloxy or benzoyloxy, n is 0, 1, 2, 3, 4 or 5,



R^5 is hydrogen, C_1–C_8-alkyl, C_7–C_{10}-phenylalkyl, cyanomethyl, aminoethyl, hydroxyethyl, C_7–C_{10}-C-acyl or benzoyl, R^6 is hydrogen, C_1–C_8-alkyl, C_7–C_{10}-phenylalkyl or phenyl and m is from 2 to 8, and the acid addition salts and hydrates of this compound.

17. A stabilized polymeric composition comprising a light and heat stabilizing amount of one or more benzimidazolecarboxanilides as claimed in claim 1 and a polymer.

4,940,743

SILICONE RESIN EMULSION

Wolfgang Grape, Koeln; Ottfried Schlak; Armand de Montigny, both of Leverkusen, and Hermann Kober, Gladbach, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Mar. 22, 1985, Ser. No. 715,148

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1984, 3412941

The portion of the term of this patent subsequent to Apr. 15, 2003, has been disclaimed.

Int. Cl.[5] C09D *183/06*

U.S. Cl. 524—377 **6 Claims**

1. A storage-stable aqueous emulsion of a low molecular weight, alkoxy-functional silicone resin by weight comprising essentially of

(a) 1–60% of a silicone resin having a viscosity of from 2 to 2000 mPa.s and of the formula

in which

R^1 is a monovalent hydrocarbon group having 1 to 14 carbon atoms,

R^2 is a monovalent hydrocarbon group having 1 to 18 carbon atoms,

x is from 0.75 to 1.5, and

y is from 0.2 to 2,

(b) 0.1 to 10% of an emulsifying agent component, wherein the emulsifying agent component is a combination of two non-ionic emulsifiers,

(c) 30 to 98.5% by weight of water, and

(d) 0 to 3% of an emulsifying auxiliary which has a thickening effect, said emulsifying auxiliary being selected from the group consisting of the sodium salt of carboxymethyl cellulose, polyvinyl alcohols and urea,

the emulsion having an alkaline pH.

5. An emulsion according to claim 1, wherein the combination of two non-ionic emulsifying agents is POE(40)-triglyceride/POE(2)-oleyl alcohol.

4,940,744

INSOLUBILIZING SYSTEM FOR WATER BASED INKS

Frank J. Tortorici, Kingsport, and Jimmy L. Nelson, Bristol, both of Tenn., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Mar. 21, 1988, Ser. No. 171,336
Int. Cl.[5] C08K 3/30, 3/10; C08L 75/04
U.S. Cl. 524—437 13 Claims

1. An aqueous system for treating a film or coating containing water dispersible polymeric material having water solubilizing sulfonate groups in its molecular structure, said system being effective for insolubilizing said groups and enhancing the water resistance of the film or coating and having dispersed therein per 100 grams of water, from about 0.0002 to about 0.5 gram-ion equivalents of a multivalent cation, and from about 0.1 to about 25.0 grams of nonionic water-dispersible polyurethane material.

6. The process for enhancing the water resistance of a film or coating containing water-dispersible polymeric material having water solubilizing sulfonate groups in its molecular structure, comprising contacting said film or coating with a system as defined in anyone of claims 1–5.

12. The process of claim 6 wherein the multivalent cation is Al^{+3}.

4,940,745

GLASS FIBER REINFORCED FLAMEPROOFED THERMOPLASTIC MOLDING COMPOSITIONS BASED ON POLYESTERS AND GRAFT POLYMERS

Dietrich Lausberg; Peter Ittemann, both of Ludwigshafen; Graham E. McKee, Weinheim; Karl Schlichting, Bobenheim-Roxheim; Manfred Knoll, Wachenheim, and Erhard Seiler, Ludwigshafen, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 255,160
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733840
Int. Cl.[5] C08K 7/14
U.S. Cl. 524—504 3 Claims

1. A flameproofed thermoplastic molding composition containing as essential components

(A) from 45 to 90 % by weight of a mixture of

(a_1) from 50 to 80 % by weight of a polyester

(a_2) from 10 to 25 % by weight of a graft polymer built up from

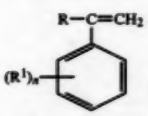
(a_{21}) from 50 to 90 % by weight of a grafting base comprising an elastomeric polymer based on

(a_{211}) from 95 to 99.9 % by weight of a C_2–C_{10}-alkyl acrylate and

(a_{212}) from 0.1 to 5 % by weight of a polyfunctional monomer having at least two olefinic, non-conjugated double bonds

(a_{22}) from 10 to 50 % by weight of a graft surface comprising

(a_{221}) from 20 to 90 % by weight of styrene or substituted styrene of the general formula I



(I)

where R is alkyl of from 1 to 8 carbon atoms, hydrogen or halogen, R^1 is alkyl of from 1 to 8 carbon atoms or halogen, and n is 0, 1, 2 or 3, or a mixture thereof, and

(a_{222}) from 10 to 80 % by weight of acrylonitrile, methacrylonitrile or a methacrylic ester or a mixture thereof and

(a_3) from 10 to 25 % by weight of a copolymer of

(a_{31}) from 50 to 90 % by weight of styrene or substituted styrene of the general formula I or of mixtures thereof and

(a_{32}) from 10 to 50 % by weight of acrylonitrile or methacrylonitrile or a mixture thereof,

(B) from 4 to 30 % by weight of a flameproofing agent

(C) from 0 to 15 % by weight of a synergistic compound of a metal of the fifth main group of the periodic table

(D) from 0.01 to 3 % by weight of a fluorine-containing ethylene polymer present in homogeneous distribution in the molding composition and having a number average particle diameter of from 0.05 to 10 μm, and in addition

(E) from 0 to 20 % by weight of a polymeric component having carboxyl, carboxyl derivative, hydroxyl or epoxy groups and

(F) from 5 to 50 % by weight of glass fibers.

4,940,746

GLASS FIBER REINFORCED THERMOPLASTIC MOLDING COMPOSITIONS BASED ON POLYESTERS AND GRAFT POLYMERS

Dietrich Lausberg, Ludwigshafen; Wolfgang Seydl, Bobenheim-Roxheim; Manfred Knoll, Wachenheim; Erhard Seiler, Ludwigshafen; Herbert Gutsche, Beindersheim, and Peter Kolm, Neustadt, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

Filed Oct. 7, 1988, Ser. No. 254,802
Claims priority, application Fed. Rep. of Germany, Oct. 7, 1987, 3733857
Int. Cl.[5] C08K 7/14
U.S. Cl. 524—504 2 Claims

1. A flameproofed thermoplastic molding composition containing as essential components

(A) from 45 to 90% by weight of a mixture of

(a_1) from 50 to 80% by weight of a polyester

(a_2) from 10 to 25% by weight of a graft polymer built up from

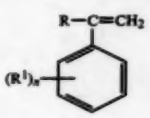
(a_{21}) from 50 to 90% by weight of a grafting base comprising an elastomeric polymer based on

(a_{211}) from 95 to 99.9% by weight of a C_2–C_{10}-alkyl acrylate and

(a_{212}) from 0.1 to 5% by weight of a polyfunctional monomer having at least two olefinic, non-conjugated double bonds

(a_{22}) from 10 to 50% by weight of a graft surface comprising

(a_{221}) from 50 to 90% by weight of styrene or substituted styrene of the general formula I



(I)

where R is alkyl of from 1 to 8 carbon atoms, hydrogen or halogen, R^1 is alkyl of from 1 to 8 carbon atoms or halogen, and n is 0, 1, 2 or 3, or a mixture thereof, and

(a_{222}) from 10 to 50% by weight of acrylonitrile or methacrylonitrile or a mixture thereof and

(a_{223}) from 0 to 10% by weight of a monomer having carboxyl, carboxyl derivative, hydroxyl or epoxy groups and

(a_3) from 10 to 25% by weight of a copolymer of

(a_{31}) from 55 to 90% by weight of styrene or substituted styrene of the general formula I or of mixtures thereof and

(a_{32}) from 10 to 45% by weight of acrylonitrile or methacrylonitrile or a mixture thereof,

(a_{33}) from 0 to 10% by weight of a monomer having carboxyl, carboxyl derivative, hydroxyl or epoxy groups and

(B) from 5 to 50% by weight of glass fibers, with the proviso that the proportion of component (a_{32}), based on the total weight of component (a_3), is lower by not less than 5% by weight than the weight proportion of component (a_{222}), based on the total weight of component (a_{22}).

4,940,747

MOULDING MATERIALS, BASED ON VINYL CHLORIDE POLYMERS, WITH IMPROVED PROCESSABILITY

Herbert Eichenauer, Dormagen; Christian Lindner, Cologne; Karl-Heinz Ott, Leverkusen, and Hans-Eberhard Braese, Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Nov. 17, 1986, Ser. No. 931,247

Claims priority, application Fed. Rep. of Germany, Nov. 30, 1985, 3542469

Int. Cl.[5] C08K *5/12;* **C08L** *9/00, 27/06, 55/02*

U.S. Cl. 524—504 **3 Claims**

1. Vinyl chloride polymer moulding materials which comprise polyvinyl chloride or copolymers of vinyl chloride with up to 50% by weight of copolymerizable compounds comprising vinyl esters, maleic anhydride or semi-esters of maleic acid and which contain 0.1 to 20% by weight of a thermoplastic polymer of styrene, α-methylstyrene, p-methylstyrene, vinyltoluene, (meth)acrylonitrile, methyl methacrylate or mixtures thereof having a limiting viscosity of 2 to 15 ml/g (measured in dimethylformamide at 25° C.) and a sulphur content of 1.15 to 3.95% by weight.

2. Moulding materials according to claim 1 which additionally contain, relative to 100 parts of moulding material, a polymer of

(A) a graft polymer of styrene, α-methylstyrene, methyl methacrylate, acrylonitrile, vinyl chloride or mixtures thereof on an elastomer base having a glass transition temperature (Tg) <0° C., in an amount of up to 80 parts by weight,

(B) a resinous thermoplastic copolymer or homopolymer, of styrene, α-methylstyrene, p-methylstyrene, vinyl-toluene, (meth)acrylonitrile, methyl methacrylate or mixtures thereof having a limiting viscosity >0.3 dl/g (measured in dimethylformamide at 25° C.), in an amount of up to 90 parts by weight, or

(C) a rubber from the series comprising the diene homo-or diene copolymers, olefine rubbers, or chlorinated polyolefines, in an amount of up to 50 parts by weight, and up to 70 parts by weight of a plasticizer for vinyl chloride polymers.

4,940,748

PLASTISOL MOLDING MATERIAL

Thomas Abend, St. Gallen, and Max Lauchenauer, Arbon, both of Switzerland, assignors to EMS-Togo AG, Domat/Ems, Switzerland

Filed Jun. 22, 1989, Ser. No. 370,330

Claims priority, application Fed. Rep. of Germany, Jun. 29, 1988, 3821926

Int. Cl.[5] C08L *27/06*

U.S. Cl. 524—521 **21 Claims**

1. A molding composition comprising a plastisol based upon polyvinyl chloride polymers and/or copolymers, a plasticizer and an acidic cation exchanger.

4,940,749

CARBON BLACK-GRAFT POLYMER, METHOD FOR PRODUCTION THEREOF, AND USE THEREOF

Yoshikuni Mori, Settsu; Mitsuo Kushino, Minoo; Hayato Ikeda, Settsu; Nobuaki Urashima, Takatsuki; Masuji Izubayashi, Nishinomiya; Shigeru Tanimori, Hirakata; Yoshihiro Arita, Takatsuki; Kiyoshi Kawamura, Mishima; Kenji Minami, Suita, and Yoshinori Sano, Kobe, all of Japan, assignors to Nippon Shokubai Kagaku Kogyo Co., Ltd., Osaka, Japan

Division of Ser. No. 134,319, Dec. 16, 1987, Pat. No. 4,880,857. This application Jun. 29, 1989, Ser. No. 373,234

Claims priority, application Japan, Dec. 17, 1986, 61-298985; Apr. 24, 1987, 62-99648; May 21, 1987, 62-122476; May 29, 1987, 62-131272; Jul. 8, 1987, 62-168868; Aug. 25, 1987, 62-209303; Sep. 3, 1987, 62-219097; Sep. 22, 1987, 62-236212; Sep. 22, 1987, 62-236214; Sep. 25, 1987, 62-238621

Int. Cl.[5] C08F *292/00*

U.S. Cl. 524—547 **28 Claims**

1. A carbon black-graft polymer, produced by causing a polymer possessing one to two reactive groups on the average selected from the class consisting of aziridine group, oxazoline group, N-hydroxyalkylamide group, and thioepoxy group to react with carbon black, wherein said polymer possesses a number average molecular weight in the range of 2,000 to 100,000.

4,940,750

CONTINUOUS PROCESS FOR THE PRODUCTION OF POWDERED POLYISOCYANATE ADDITION PRODUCTS AND THE POWDERS PRODUCED THEREFROM

James W. Rosthauser, Imperial, Pa., and Walter Meckel, Neuss, Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany and Mobay Corporation, Pittsburgh, Pa.

Filed Apr. 28, 1989, Ser. No. 344,882

Int. Cl.[5] C08G *18/80*

U.S. Cl. 524—871 **24 Claims**

1. A continuous process for the production of powdered polyisocyanate addition products in finely divided form which comprises simultaneously

(a) mixing a polyisocyanate component, an isocyanate-reactive component and an inert organic medium containing a surfactant, wherein at least one of said components is insoluble in said inert organic medium, in a low shear stator-rotor dynamic mixer operating at speeds of about 300 to 8000 rpm, utilizing a mixing wattage of about 0.05 to 10.0 watts per cubic centimeter and having a mixing volume of at least about 0.1 liters and

(b) reacting the polyisocyanate component with the isocyanate reactive-reactive component in the inert organic medium to form solid polyisocyanate addition products which can be separated from the inert organic medium to form a powder, the average residence time of the components and the inert organic medium in the dynamic mixer being about 3 to 300 seconds and the overall flow rate through the dynamic mixer being at least about 20 kg/h.

4,940,751

WETTABLE SILICON ELASTOMER FOR THE MANUFACTURE OF CONTACT LENSES

Jean-Marc Frances, Villeurbanne, and Georges Wajs, Ivry sur Seine, both of France, assignors to Essilor International (Compagnie Generale d'Optique), Creteil, France

Filed Oct. 24, 1988, Ser. No. 261,790

Claims priority, application France, Oct. 23, 1987, 87 14681

Int. Cl.[5] C08G *180/00*

U.S. Cl. 525—54.2 **18 Claims**

1. A wettable organic material comprising: a cross-linked silicon elastomer which comprises at least one orgtanopolysiloxane component having vinyl groups and at least one organohydrogenopolysiloxane component having SiH groups,

wherein at least one of said components has epoxy functions on the surface of said elastomer, in an amount effective to produce surface wettability.

4,940,752

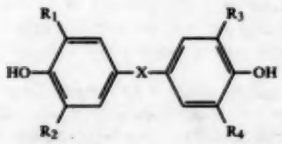
STYRENIC POLYCARBONATE ALLOYS

Lawrence Y. Lo, Lexington, and Paul R. Boulier, Leominster, both of Mass., assignors to Polysar Financial Services S.A., Fribourg, Switzerland

Division of Ser. No. 286,156, Dec. 19, 1988, Pat. No. 4,866,125. This application May 8, 1989, Ser. No. 348,517
Int. Cl.[5] C08L 69/00
U.S. Cl. 525—67 5 Claims

1. A process for preparing a polymer blend comprising blending a mixture comprising:

(A) from 20 to 90 part by weight of one or more homo-and co-polycarbonates which are based on one or more poly phenols selected from the group consisting of hydroquinone, resorcinol, and polyphenols of the formula.



I

wherein

R_1, R_2, R_3, R_4 are independently selected from the group consisting of a hydrogen atom, a chlorine atom, a bromine atom, and a C_{1-4} alkyl radical; and

X is a bond or divalent radical selected from the group consisting of C_{1-10} alkylene radicals;

C_{2-8} alkenylene radicals, and C_{6-8} cycloalkylene radicals; and

(B) from 80 to 10 parts by weight of a graft copolymer comprising

(i) 25 to 75 parts by weight of a C_{8-10} vinyl aromatic monomer which is unsubstituted or substituted at the vinyl radical by a C_{1-2} alkyl radical and which may be substituted in the aromatic ring by up to two substituents selected from the group consisting of chlorine and bromine atoms and C_{1-4} alkyl radicals;

(ii) from 7 to 30 parts by weight of a copolymerizable C_{2-8} alkyl or hydroxy alkyl ester of a C_{3-6} ethylenically unsaturated acid provided that homopolymers of such esters have a Tg of less than 40° C.; and

(iii) from 10 to 50 parts by weight of methyl methacrylate which is grafted to from 2 to 20 parts by weight of linear and radical di and tri block copolymers having a molecular weight of not less than 75,000 and a styrene content from 20 to 50 weight % selected from the group consisting of styrene-butadiene diblock copolymers, styrene-butadiene-styrene triblock copolymers, styrene-isoprene diblock copolymers, styrene-isoprene-styrene triblock copolymers, partially hydrogenated styrene-butadiene-styrene triblock copolymers, and partially hydrogenated styrene-isoprene-styrene triblock copolymers; said blending procedure selected from the group consisting of:

(i) blending using an intensive mixer; and

(ii) solution blending.

4,940,753

POLYPHENYLENE ETHER RESIN COMPOSITION

Ken-ichi Okada, and Hideo Kasahara, both of Yokosuka, Japan, assignors to Asahi Kasei Kogyo Kabushiki Kaisha, Osaka, Japan

Filed Apr. 9, 1986, Ser. No. 849,792
Claims priority, application Japan, Apr. 19, 1985, 60-82193
Int. Cl.[5] C08L 71/04
U.S. Cl. 525—68 17 Claims

1. A polyphenylene ether resin composition having rubber particles dispersed therein, said composition having been formulated by blending a polyphenylene ether resin with a rubber reinforced styrenic resin, said particles having a distribution of sizes such that there are at least one maximal value at 1.5 μ or less and at least one maximal value at 2 to 3 μ in volume fraction of the sizes, with the ratio of the former maximal value to the latter maximal value being within the range of from ¼ to 4/1, and substantially no rubber particles having a size larger than 3 μ.

4,940,754

EASILY COLORED THERMOPLASTIC MOLDING COMPOSITION

Todd T. Lensmire; Robert J. Donald; Sheldon G. Turley, and Bruce J. Tallmadge, all of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed May 17, 1988, Ser. No. 194,759
Int. Cl.[5] C08L 51/04
U.S. Cl. 525—80 5 Claims

1. A pigmented, opaque thermoplastic molding composition comprising:

A. 95–80 percent of a matrix phase comprising, in polymerized form, from about 75–65 percent styrene, 25–15 percent acrylonitrile and 1–18 percent of a lower alkyl methacrylate; and

B. 5 to 20 percent of a grafted rubber phase obtained by polymerizing styrene, acrylonitrile and a lower alkyl methacrylate in the presence of a rubbery polymer, said composition having a solubility parameter from 9.90 to 9.70 $[cal/cm^3]^{\frac{1}{2}}$, thermal stability so as to result in a yellowness color change, Δb, measured according to ASTM E308-85 after heating in air for 8 hours at 150° C. of less than 11, and an opacity factor of 0.052 or less.

4,940,755

THERMOPLASTIC MOULDING COMPOSITIONS BASED ON POLYVINYL CHLORIDE AND A POLY-α-OLEFINE/POLYURETHANE BLOCK COPOLYMER

Lothar Meier, Sprockhoevel; Maria Gärtner, Bergisch-Gladbach; Kurt P. Meurer, Koenigswinter; Joachim Franke, and Christian Lindner, both of Cologne, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Fed. Rep. of Germany

Filed Dec. 30, 1988, Ser. No. 292,261
Claims priority, application Fed. Rep. of Germany, Jan. 13, 1988, 3800684
Int. Cl.[5] C08L 53/00, 75/04
U.S. Cl. 525—90 2 Claims

1. Thermoplastic moulding compositions of polyvinyl chloride and a block copolymer, characterised in that the compositions comprise 30–80 weight % polyvinyl chloride and 70–20 weight % of a poly-α-olefine/polyurethane block copolymer (PAO/PU) and the block copolymer is prepared from

A. isocyanate reactive, functionalised poly(C_2–C_{10}-α-olefines) having a molecular weight M_w of from 1000 to 350,000,

B. organic di- or higher poly-isocyanates or modified poly-isocyanates and isocyanate prepolymers, and optionally

C. isocyanate reactive compounds containing Zerewitinoff active hydrogen atoms with molecular weights of from 400 to 5000, and optionally

D. low molecular weight compounds in the molecular

weight range of from 62 to 399 functioning as chain lengthening agents or difunctional and oligo functional amines in the molecular weight range of from 32 to 399 as chain lengthening agents or cross-linking agents,

the reaction mixture containing at least one of the components C and D.

4,940,756

ELASTOMERS AND TIRES CONTAINING THEM

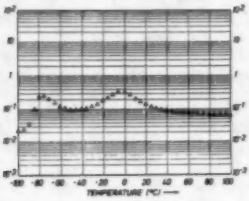
Antonius A. Broekhuis; Pieter Luijk, and Jan E. Stamhuis, all of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

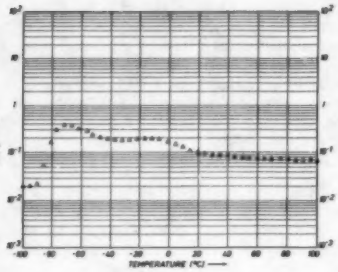
Continuation of Ser. No. 124,307, Nov. 23, 1987, abandoned. This application Jan. 20, 1989, Ser. No. 300,244

Claims priority, application United Kingdom, Dec. 2, 1986, 8628838

Int. Cl.[5] C08F 297/04; C08L 9/00, 9/06

U.S. Cl. 525—237 12 Claims





1. A vulcanized elastomeric composition, the vulcanized elastomeric composition comprising the product of vulcanizing an unvulcanized elastomeric composition suitable for use in the tread portion of a pneumatic tire, said unvulcanized elastomeric composition comprising:

(1) a copolymer (A) of a first aromatic vinyl compound and a first conjugated diene and having a content of said first aromatic vinyl compound in the range of from 52 to 90% by weight based on said copolymer (A), an apparent molecular weight of at least 25,000 and a vinyl content in the conjugated diene units therein of less than 20% by weight, and

(2) a polymer (B) which is a homopolymer of a second conjugated diene or a copolymer of a second aromatic vinyl compound and said second conjugated diene, said polymer (B) containing less than 20% by weight of said second aromatic vinyl compound and having a glass transition temperature below minus 40° C.,

(3) said copolymer (A) being present in the range from 5 to 50% by weight and correspondingly said polymer (B) being present in the range of from 95 to 50% by weight based on the combined weight of said copolymer (A) and said polymer (B),

(4) wherein said copolymer (A) and polymer (B) are present in said unvulcanized elastomeric composition as a block copolymer in which said copolymer (A) and said polymer (B) form the polymeric blocks thereof, and

(5) wherein after vulcanization of said unvulcanized elastomeric composition a first maximum is present in the range of from plus 30° C. to minus 20° C. and a second maximum is present at a temperature of not higher than minus 40° C. in a curve representing tan δ of said vulcanized elastomeric composition as a function of the temperature, measured at a frequency of 10 Hz and 0.5% strain amplitude, thereby establishing that copolymer block (A) is incompatible with polymer block (B).

12. An unvulcanized elastomer composition suitable for use in the tread portion of a pneumatic tire once said unvulcanized elastomeric composition is vulcanized, said unvulcanized elastomeric composition comprising:

(a) a polymeric composition comprising

(1) a copolymer (A) of a first aromatic vinyl compound and a first conjugated diene, said copolymer (A) having (i) a content of said first aromatic vinyl compound in the range from 52% to 90% by weight based on said copolymer (A), (ii) an apparent molecular weight of at least 25,000, and (iii) a vinyl content in the conjugated diene portion thereof of less than 20% by weight based on the conjugated diene portion of said copolymer (A), and

(2) a polymer (B) which is a homopolymer of a second conjugated diene or a copolymer of a second aromatic vinyl compound and said second conjugated diene, said polymer (B) containing less than 20% by weight of said second aromatic vinyl compound and having a glass transition temperature below minus 40° C.,

(3) said copolymer (A) being present in the range of from 5% to 50% by weight and correspondingly said polymer (B) being present in the range from 95% to 50% by weight based on the combined weight of said copolymer (A) and said polymer (B),

(4) wherein said copolymer (A) and said polymer (B) are present in said polymeric composition as a physical mixture thereof, as a block copolymer in which said copolymer (A) and said polymer (B) form the polymeric blocks of said block copolymer, and

(b) an effective vulcanizing amount of a blend of vulcanization compounding ingredients, said blend comprising a combination of

(1) a vulcanizing agent,

(2) a vulcanization accelerating agent,

(3) a vulcanization activating agent,

(4) a filler,

(5) an antioxidant, and

(6) an extender oil,

(c) wherein after vulcanization of said unvulcanized elastomeric composition a first maximum is present in the range of from plus 30° C. to minus 20° C. and a second maximum is present at a temperature of not higher than minus 40° C. in a curve representing tan δ of said unvulcanized elastomeric composition after vulcanization as a function of the temperature, measured at a frequency of 10 Hz and 0.5% strain amplitude, thereby establishing that said copolymer (A) is incompatible with said polymer (B) or that the block polymer blocks corresponding to same are incompatible with each other.

4,940,757

STAIN RESISTANT POLYMERIC COMPOSITION

Thomas H. Moss, III; Ralph R. Sargent, and Michael S. Williams, all of Rome, Ga., assignors to Peach State Labs, Inc., Rome, Ga.

Filed Apr. 20, 1989, Ser. No. 341,774
Int. Cl.[5] C08G 8/30, 8/18
U.S. Cl. 525—502 21 Claims

1. A stain resistant composition comprising a polymeric product prepared by:

polymerizing $H_2C{=}C(R)CO_2X$, where R is a hydrocarbon, halogenated hydrocarbon, or sulfonated hydrocarbon of from C_1 to C_{15}, phenol, naphthol, sulfonated phenol, sulfonated naphthol or a halogen, and X is H or a hydroxylated, ethoxylated, sulfonated, or halogenated hydrocarbon of C_1 to C_{15}, in the presence of a sulfonated aromatic formaldehyde condensation polymer.

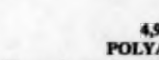
4,940,758

POLYALCOHOL

Pui K. Wong, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Division of Ser. No. 138,767, Dec. 29, 1987, Pat. No. 4,868,254. This application Apr. 13, 1989, Ser. No. 337,713
Int. Cl.[5] C08G 67/02
U.S. Cl. 525—539 5 Claims

1. The polymeric polyalcohol represented by repeating units having the formula



having a molecular purity of at least 90% as measured by Nuclear Magnetic Resonance and less than 0.5% 1,2-glycol moieties as measured by periodic acid titration.

4,940,759

PROCESS FOR MAKING FILM GRADE PVC

Yung-Chin Yang, Bay Village, Ohio, assignor to The B.F. Goodrich Company, Akron, Ohio

Continuation of Ser. No. 904,428, Sep. 5, 1986. This application Mar. 20, 1989, Ser. No. 325,629
Int. Cl.[5] C08F 2/20
U.S. Cl. 526—62 13 Claims

1. A process for producing a vinyl chloride type resin having a low gel content, comprising the steps of:

adding at least one vinyl chloride type monomer charge to a reaction vessel coated with an aromatic inhibitor polymer build-up compound, adding to said vessel an effective amount of a primary dispersant system containing a 70 to a 98 mole percent hydrolyzed dispersant and a modified cellulose ether dispersant in an amount from 0% to about 80% by weight based upon the total weight of the primary dispersant system, and adding an effective amount of a 10 to a 60 mole percent hydrolyzed secondary dispersant which contains 5% by weight or less of an organic solvent to produce a vinyl chloride resin having a low gel content upon polymerization,

polymerizing said vinyl chloride type monomer in said coated vessel to produce a low gel vinyl chloride type resin, and

repeating said process at least 12 times and producing a low gel content vinyl chloride type resin under continuous production conditions free of cleaning said reaction vessel.

4,940,760

GROUP TRANSFER POLYMERIZATION PROCESS EMPLOYING SUPPORTED INITIATORS

Fritz P. Boettcher, Newark; Ira B. Dicker; Richard C. Ebersole, both of Wilmington, all of Del., and Walter R. Hertler, Kennett Square, Pa., assignors to E. I. du Pont de Nemours and Company, Wilmington, Del.

Continuation of Ser. No. 156,008, Feb. 16, 1988, abandoned. This application Oct. 6, 1989, Ser. No. 418,007
Int. Cl.[5] C08F 4/16, 4/02, 20/14
U.S. Cl. 526—190 8 Claims

1. Group Transfer Polymerization (GTP) process for preparing a "living" polymer, the process comprising contacting under polymerizing conditions in a polymerization medium, at least one acrylic or maleimide monomer with an initiator which is a tetracoordinate organosilicon, organotin or organogermanium compound having at least one GTP inititaing site and a catalyst which is, or is a source of, an anion selected from the group consisting of bifluoride, fluoride, cyanide, axide or a selected oxyanion, or a selected Lewis acid or Lewis base, the process further characterized in that the initiator is chemically attached to a solid support that is insoluble in the polymerization medium.

4,940,761

GROUP TRANSFER POLYMERIZATION OF GLYCIDYL (METH)ACRYLATE COPOLYMERS TO FORM OXIRANE GROUP-TERMINATED BLOCK COPOLYMERS

Harry J. Spinelli, Wilmington, Del., and Gordon M. Cohen, Wynnewood, Pa., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.

Continuation-in-part of Ser. No. 008,958, Jan. 30, 1987, abandoned, which is a division of Ser. No. 868,083, May 29, 1986, abandoned. This application Nov. 21, 1988, Ser. No. 274,462
Int. Cl.[5] C08F 24/00, 224/00
U.S. Cl. 526—273 5 Claims

1. An improved process for the preparation of an ABA block copolymer having a center segment between two end segments, each end segment being an oxirane-containing acrylic or methacrylic moiety, said center segment being an acrylic or methacrylic moiety not containing oxirane groups, wherein the improvement comprises reacting the ingredients by group transfer polymerization using an initiator comprised of an activating moiety which contains an oxirane group substituent which remains at the non-living end of the polymer being formed and wherein the initiator is reacted with a monomer or monomers selected from the group consisting of acrylic and methacrylic monomers to first form polymer chains having a terminal oxirane group at one end of a chain and a living group at the other end, and then using a coupling agent to react two of said chains together at their living ends whereby an ABA copolymer is formed having an oxirane terminal group on each end.

4,940,762

OXYGEN PERMEABLE LENS WITH HYDROLYZABLE SILICON GROUP

James C. Powell, Minnetonka, Minn., assignor to Pilkington Visioncare, Inc., Menlo Park, Calif.

Division of Ser. No. 570,736, Jan. 16, 1984, Pat. No. 4,581,184, which is a continuation-in-part of Ser. No. 319,193, Nov. 9, 1981, Pat. No. 4,611,039. This application Aug. 26, 1985, Ser. No. 769,847
The portion of the term of this patent subsequent to Apr. 8, 2003, has been disclaimed.
Int. Cl.[5] C08F 30/08
U.S. Cl. 526—279 14 Claims

1. An optically clear, hard, mechanically stable, gas permeable, wettable vision correction lens which comprises a polymeric matrix having randomly polymerized in the matrix, residues derived from an ethylenically unsaturated silicone

containing monomer having a hydrolyzable silicone group which after hydrolysis leave a silicone-free hydrophilic site, in an amount sufficient to provide gas permeability to the matrix and wettability to the lens surface when hydrated.

4,940,763

WATER SOLUBLE POLYMERS

Peter Flesher, Bingley; David Farrar, Bradford; Malcolm Hawe, Huddersfield, and John Langley, Shipley, all of England, assignors to Allied Colloids Limited, United Kingdom

Continuation-in-part of Ser. No. 766,097, Aug. 15, 1985, Pat. No. 4,702,844. This application Oct. 26, 1987, Ser. No. 113,599

Claims priority, application United Kingdom, Aug. 15, 1984, 8420693; Aug. 15, 1984, 8420694; Aug. 15, 1984, 8420695; Feb. 12, 1985, 8520218

Int. Cl.[5] C08F 20/60

U.S. Cl. 526—307 **13 Claims**

1. A water soluble, substantially linear, polymer having a single point intrinsic viscosity of at least about 3 and that is a copolymer of

(a) 1 to 90% by weight ethylenically unsaturated monomer that includes a group $-B_nR$ where B is ethoxy, n is an integer of 2 to 100 and R is a hydrocarbyl group of 8 to 0 carbon atoms, and

(b) 99 to 10% by weight of at least one water soluble, ethylenically unsaturated comonomer selected from dialkylamino alkyl (meth) -acrylates an -acrylamides, including acid addition and quaternary ammonium salts thereof, and water soluble non-ionic monomers,

and in which the monomers from which the polymer is formed include 10 to 99% by weight of tertiary amine acid addition or quaternary ammonium salt monomer.

4,940,764

WATER SOLUBLE GRAFT COPOLYMERS OF LIGNIN AND METHODS OF MAKING THE SAME

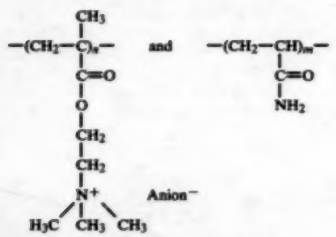
John J. Meister, 31675 Westlady Rd., Beverly Hills, Mich. 48010-5624

Filed Dec. 19, 1988, Ser. No. 286,534

Int. Cl.[5] C08H 5/02

U.S. Cl. 527—400 **24 Claims**

1. A positively-charged water-soluble graft copolymer of lignin with an anion, having a central lignin network and at least one grafted side chain having randomly repeating units of the formulas:



wherein the ratio of such repeating units range from about one molar percent to about 100 molar percent, and from about zero molar percent to about 99 molar percent, respectively, such that the central lignin network has a molecular weight of about 1,000 to 150,000 and the total number of randomly repeating units in the grafted side chain or chains is in the range of 50 to 300,000 units, and such that the total graft copolymer molecular weight is in the range of 15,000 to 30,000,000.

24. The method for preparing a complex polymer of lignin which comprises:

(a) adding a hydroperoxide to a solvent consisting of a mixture of fluids of differing polarity such that the total solvent is highly effective in dissolving monomers to be attached to the lignin; and

(b) adding lignin, a chloride-containing salt, 2-propenamide and 2-methyl-N7,N7-dimethyl-7-ammonium-3-oxo-4-oxyoct-1-ene chloride or methylsulfate to said solution, thereby initiating free radical polymerization.

4,940,765

3-BENZYLIDENECAMPHOR-SUBSTITUTED DIORGANOPOLYSILOXANES

Edith Canivenc, Lyons; Serge Forestier, Claye-Souilly; Michel Gay, Lyons; Gerard Lang, Saint-Gratien, and Herve Richard, Paris, all of France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

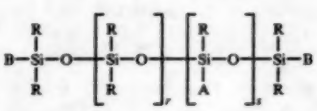
Filed Dec. 29, 1988, Ser. No. 291,698

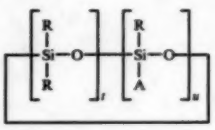
Claims priority, application France, Dec. 29, 1987, 87 18509

Int. Cl.[5] C08G 77/06

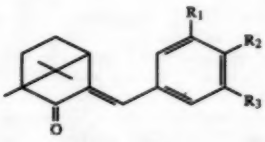
U.S. Cl. 528—15 **7 Claims**

1. A modified diorganopolysiloxane polymer having one of the structural formulae (1) or (2):

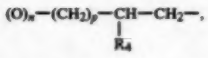




in which the symbols R, which may be identical or different, are each a C_1–C_{10} alkyl, phenyl or 3,3,3-trifluoropropyl radicals, at least 80% of the number of radicals R being methyl radicals; the symbols B, which may be identical or different, are each a radical R or a radical A; r is an integer ranging from 0 to 200, inclusive; s is an integer ranging from 0 to 50, inclusive, with the proviso that, if s is 0, at least one of the two symbols B is A; u is an integer ranging from 1 to 20, inclusive; t is an integer ranging from 0 to 20, inclusive; t+u is equal to or greater than 3; and A is a radical of the formula (3):



in which R_1 and R_2 are each a hydrogen atom, a C_1–C_6 alkyl radical, a C_1–C_6 alkoxy, hydroxy or trimethylsiloxy radical, or a divalent radical Y:



with the proviso that one of the two radicals R_1 and R_2 is necessarily the divalent radical Y; R_4 is a hydrogen atom or a C_1–C_4 alkyl radical; D is 0 or 1; p is an integer ranging from 1 to 10, inclusive; and R_3 is a hydrogen atom or a C_1–C_6 alkyl or C_1–C_6 alkoxy radical.

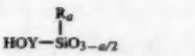
4,940,766

ACRYLATE AND/OR METHACRYLATE-SUBSTITUTED ORGANOPOLYSILOXANES

Michel Gay, and Edith Canivenc, both of Lyons, France, assignors to Rhone-Poulenc Chimie, Courbevoie, France

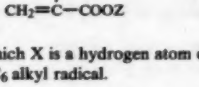
Filed Aug. 12, 1987, Ser. No. 84,181
Claims priority, application France, Feb. 24, 1987, 87 02617
Int. Cl.[5] C08G 77/08
U.S. Cl. 528—18 16 Claims

1. A process for the preparation of an organopolysiloxane comprising acrylate and/or methacrylate functional groups, which comprises at least partially transesterifying, in the presence of a catalytically effective amount of a tin-containing compound (A) having a valency of 4 selected from the group consisting of inorganic compounds of tin and organic compounds of tin selected from dialkyltin oxide, tin carboxylate, dialkytin dicarboxylate, tin chelate or the reaction product of a dialkyltin oxide with an organic ester or alkyl silicate, an organopolysiloxane (B) containing at least two siloxy, u nits per molecule, at least one of such units corresponding to the formula:



(1)

in which a is 1 or 2, the symbols R, which may be identical or different, are each a C_1–C_{12} alkyl radical, a phenyl radical or a 3,3,3-trifluoropropyl radical, at least 80 mole % of radicals R being methyl radicals, and the symbols Y, which may be identical or different, are each a C_1–C_{18} straight or branched chain alkylene linkage, with an ester (C) of the formula:



(2)

in which X is a hydrogen atom or a methyl radical and Z is a C_1–C_6 alkyl radical.

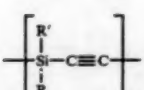
4,940,767

SILYLENE- AND DISILYLENEACETYLENE POLYMERS FROM TRICHLOROETHYLENE

Thomas J. Barton, and Sina Ijadi-Maghsoodi, both of Ames, Iowa, assignors to Iowa State University Research Foundation, Inc., Ames, Iowa

Filed Aug. 1, 1988, Ser. No. 226,444
Int. Cl.[5] C08G 77/60
U.S. Cl. 528—35 10 Claims

1. A method of preparing organosilicon polymers having recurring silyleneacetylene units of the formula:



wherein R and R' are organic moieties selected from the group consisting of hydrogen, C_1 to C_{20} alkyl, C_6 to C_{20} aryl, and C_7 to C_{20} alkylaryl and x is an integer from 20 to 500, comprising:

reacting trichloroethylene with normal butyllithium to prepare dilithioacetylene; and

reacting said dilithioacetylene with a dichlorosilane of the formula: $RR'SiCl_2$, wherein R and R' are as previously defined.

4,940,768

CURING AGENT FOR SYNTHETIC RESINS, CURABLE MIXTURES CONTAINING THIS CURING AGENT AND ITS USE

Michael Hönel, Mainz; Manfred Finke, Kelkheim; Gerd Walz, Wiesbaden, and Peter Ziegler, Mainz, all of Fed. Rep. of Germany, assignors to Hoechst AG, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,898
Claims priority, application Fed. Rep. of Germany, Mar. 23, 1988, 3809695
Int. Cl.[5] C08G 18/80
U.S. Cl. 528—45 24 Claims

1. A curing agent (A) for resins (B) curable by means of isocyanates which has an amine number of 20 to 150 mg of KOH/g and an OH number of not more than 20 mg of KOH/g and contains, per molecule, at least two masked isocyanate groups which are reactive under the conditions of curing, and which is obtained by reacting

(a) an amine which contains at least one β-hydroxyalkyl group per molecule, has an OH of 100 to 1,200 mg of KOH/g and an amine number of 100 to 1,200 mg of KOH/g with

(b) a partly masked polyisocyanate.

4,940,769

NOVEL THIOETHER AMIDE DIOLS AND POLYURETHANE POLYMERS THEREFROM

Anil B. Goel, Marlboro, N.J., assignor to Ashland Oil, Inc., Russell, Ky.

Division of Ser. No. 264,650, Nov. 30, 1988, Pat. No. 4,891,416, which is a division of Ser. No. 852,588, Apr. 16, 1986, Pat. No. 4,804,781. This application Jul. 21, 1989, Ser. No. 382,926
Int. Cl.[5] C08G 18/32
U.S. Cl. 528—85 5 Claims

1. A process for preparing a polyurethane comprising reacting a thioether diol with a polyisocyanate wherein the thioether diol is one produced by reacting a bicyclic amide acetal with hydrogen sulfide at a temperature in the range of from 20° C. to 200° C. wherein the mole ratio of bicyclic amide acetal to hydrogen sulfide is in the range of from about 1:1 to about 2:1.

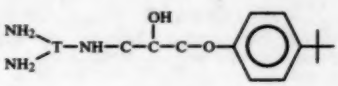
4,940,770

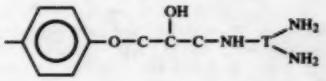
NOVEL COMPOSITIONS FROM POLYOXYALKYLENE AMINES AND EPOXIDES

George P. Speranza, Austin, and Jiang-Jen Lin, Houston, both of Tex., assignors to Texaco Chemical Co., White Plains, N.Y.

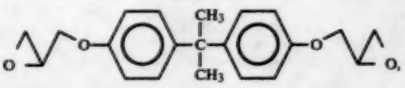
Filed Nov. 14, 1988, Ser. No. 270,897
Int. Cl.[5] C08G 18/32, 59/14
U.S. Cl. 528—111 8 Claims

1. A hydroxypolyamine useful as an epoxy curing agent having the formula:

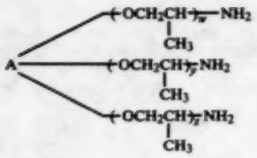




which is the reaction product of a polyoxypropylene triamine and an epoxy component of the formula:



wherein T is derived from a polyoxypropylene triamine of the formula:



wherein A represents the nucleus of an oxyalkylation susceptible trihydric alcohol containing about 3 to about 6 carbon atoms, w, y and z are numbers and the average value of the sum of w+y+z is from about 4 to about 100.

4,940,771

REACTIVE POLYCARBONATE END CAPPED WITH HYDROXY PHENYL OXAZOLINE

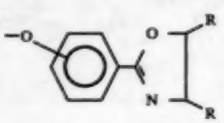
Louis M. Maresca, Schenectady, N.Y., assignor to General Electric Company, Mt. Vernon, Ind.

Filed Jan. 30, 1989, Ser. No. 280,846

Int. Cl.[5] C08G 64/14

U.S. Cl. 528—199 **31 Claims**

1. An aromatic polycarbonate or polyarylate resin having a polymer chain terminated with a monovalent group of the formula:



(I)

wherein each R is independently selected from the group consisting of hydrogen and lower alkyl.

4,940,772

PROCESS FOR PRODUCING FLAME RESISTANT POLYESTER

Tetsuo Matsumoto; Keizo Tsujimoto, both of Aichi; Katsuto Matsuzawa, Tokyo; Shunichiro Hamada, Aichi; Kouzi Shinogi, Aichi; Satomi Nagai, Aichi; Takayuki Imamura, Aichi, and Akiko Kuroyanagi, Aichi, all of Japan, assignors to Nippon Ester Co., Ltd., Aichi, Japan

Continuation of Ser. No. 225,441, Jul. 28, 1988, abandoned. This application Nov. 20, 1989, Ser. No. 439,129

Int. Cl.[5] C08G 63/02

U.S. Cl. 528—272 **4 Claims**

1. A process for producing a flame resistant polyester which comprises: preliminary copolymerizing a polyester selected from the group consisting of polyethylene terephthalate and polybutylene terephthalate with 0.5 to 25% by mol, based on the total acid components of said polyester, of an unsaturated compound having esterifying functional group(s); and then reacting the obtained prepolymer with a phosphorous compound represented by the following formula in an amount not exceeding the equivalent of the unsaturated bond of said unsaturated compound:

(I)

wherein R_1 and R_2 may be either the same or different from each other and each represents an alkyl group having 1 to 20 carbon atoms, an aryl group having 6 to 20 carbon atoms, an alkoxy group having 1 to 20 carbon atoms or an aryloxy group having 6 to 20 carbon atoms, or R_1 or R_2 may combine to form a ring with phosphorous atom.

4,940,773

PROCESS FOR PRODUCING MODIFIED, IMPACT-RESISTANT POLYAMIDES WITH LACTAM-BLOCKED DIISOCYANATE/MONOISOCYANATE

Sergio Tonti, Venice; Piero Furlan, Treviso, and Gianpietro Talamini, Venice, all of Italy, assignors to Montedipe S.p.A., Milan, Italy

Filed Jul. 11, 1989, Ser. No. 377,964

Claims priority, application Italy, Jul. 11, 1988, 21309 A/88

Int. Cl.[5] C08G 69/20

U.S. Cl. 528—315 **20 Claims**

1. Process for preparing an impact-resistant polyamide endowed with a high polymerization rate, consisting essentially in polymerizing an ω-lactam in the presence of:

(a) a mixture of a di-isocyanate and a monoisocyanate, the isocyanate groups of both of which are blocked with an ω-lactam;

(b) a poly-oxy-alkylene-amine having an amine functionality lower than 3, and

(c) an alkaline catalyst.

4,940,774

CARBON MONOXIDE/OLEFIN POLYMERIZATION WITH DILUENT COMPRISING APROTIC SOLVENT AND WATER

Pui K. Wong, Katy, Tex., assignor to Shell Oil Company, Houston, Tex.

Filed Aug. 16, 1989, Ser. No. 394,688

Claims priority, application Netherlands, Sep. 29, 1988, 8802391

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 **9 Claims**

1. In the process for producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and unsaturated hydrocarbon by contacting the carbon monoxide and unsaturated hydrocarbon under polymerization conditions in the presence of a reaction diluent and a catalyst composition formed from a palladium compound, the anion of a non-hydrohalogenic acid having a pKa below 6 and a bidentate ligand of phosphorus, the improvement of employing as the reaction diluent a miscible mixture of an aprotic diluent and water.

4,940,775

POLYKETONE FROM CARBON MONOXIDE/MONOETHYLENICALLY UNSATURATED HYDROCARBON/NON-CONJUGATED ALKADIENE

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed May 15, 1989, Ser. No. 352,234

Claims priority, application Netherlands, Jul. 13, 1988, 8801773

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 **20 Claims**

1. A linear alternating terpolymer of carbon monoxide, monoethylenically unsaturated hydrocarbon and non-conjugated alkadiene having at least one carbon atom between the two carbon-carbon double bonds.

4,940,776

CATALYTIC POLYMERIZATION OF CARBON MONOXIDE/OLEFIN IN THE PRESENCE OF INSOLUBLE PARTICULATE SOLID MATTER

Jacobus A. Bakkum, and Gerrit G. Rosenbrand, both of Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Filed Apr. 14, 1989, Ser. No. 338,246

Claims priority, application Netherlands, Apr. 27, 1988, 8801095

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 15 Claims

1. In the process of producing a linear alternating polymer of carbon monoxide and at least one ethylenically unsaturated hydrocarbon by contacting the carbon monoxide and hydrocarbon in the presence of an inert reaction diluent and a catalyst composition formed from a palladium salt, the anion of a non-hydrohalogenic acid having a pKa below 2 and a bidentate ligand of phosphorus, the improvement which comprises adding to the reaction diluent a small concentration of insoluble particulate solid matter wherein the concentration of the particulate solid matter in the reaction diluent expressed in grams per liter, is equal to or greater than 100 (b)(c), wherein b is the average particle size of the solid matter expressed in meters and c is the bulk density of the solid matter, expressed in kilograms per cubic meter.

4,940,777

CARBON MONOXIDE/1,2-ALKADIENE COPOLYMER

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Apr. 18, 1989, Ser. No. 339,783

Claims priority, application Netherlands, May 4, 1988, 8801168

Int. Cl.[5] C08G 67/02

U.S. Cl. 528—392 20 Claims

1. A linear alternating copolymer of carbon monoxide and 1,2-alkadiene having repeating units of the formula

wherein G is an unsaturated moiety of a 1,2-alkadiene of the formula $CH_2=C=CH-R$ in which R is alkyl, polymerized through carbon-carbon unsaturation.

4,940,778

PROCESS FOR PREPARATION OF METHACRYLIMIDE GROUP-CONTAINING POLYMER

Hisao Anzai; Kozi Nishida, both of Ohtake; Isao Sasaki, Hiroshima; Hideaki Makino, Ohtake, and Masami Ohtani, Yamaguchi, all of Japan, assignors to Mitsubishi Rayon Company, Ltd., Tokyo, Japan

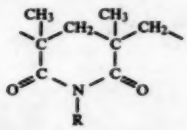
Filed Jul. 18, 1988, Ser. No. 220,617

Claims priority, application Japan, Jul. 20, 1987, 62-179169

Int. Cl.[5] C08F 6/00, 20/52

U.S. Cl. 528—481 9 Claims

1. A process for the preparation of an improved methacrylimide group-containing polymer, which comprises obtaining as a starting material a methacrylimide group-containing polymer having imide ring structural units represented by the following structural formula (I):



(I)

wherein R represents a hydrogen atom, a substituted or unsubstituted alkyl, cycloalkyl, aryl, alkaryl, aralkyl or allyl group containing from 1 to 20 carbon atoms; and heat-treating the starting material at a temperature of from 190° to 350° C. in the presence of a tertiary amine having the following formula (II):

(II)

wherein R_1, R_2, and R_3 independently represent an alkyl, aryl, aralkyl or alkaryl group having from 1 to 20 carbon atoms, and two of R_1, R_2, and R_3 may be linked to form a ring together with the nitrogen atom.

4,940,779

METHOD FOR THE PREPARATION OF A POLYCARBONATE POWDER

Takashi Ashida, and Koji Yamamoto, both of Ichihara, Japan, assignors to Idemitsu Petrochemical Co., Ltd., Tokyo, Japan

Continuation of Ser. No. 164,533, Mar. 7, 1988, abandoned. This application Mar. 23, 1989, Ser. No. 328,720

Claims priority, application Japan, Mar. 30, 1987, 62-74250

Int. Cl.[5] C08G 17/13

U.S. Cl. 528—495 14 Claims

1. A method for the preparation of a polycarbonate resin powder from a solution of the resin which comprises blending together a solution of polycarbonate resin in a good solvent of the resin selected from the group consisting of methylene chloride, tetrachloroethane, tricholorethane, chloroform, dioxane and tetrahydrofuran; and a poor solvent of the resin selected from the group consisting of aliphatic hydrocarbon solvents, aromatic hydrocarbon solvents, alcohols, ketones, and ethers, in a blending machine of self-cleaning type either separately or as mixed together before to form a mixture thereof and removing the solvents to recover said polycarbonate resin powder, said blending machine being of the type having paddles fixed to a pair of parallel shafts around which they rotate in a cylindrical chamber and scrape an inner wall of the chamber; and controlling the particle size distribution in the polycarbonate powder by maintaining a clearance between the paddles and the inner wall of not more than 10 mm.

4,940,780

BASICALLY SUBSTITUTED PHENYLACETONITRILES, THEIR PREPARATION AND DRUGS CONTAINING THESE COMPOUNDS

Werner Seitz, Plankstadt; Liliane Unger, Ludwigshafen; Manfred Raschack, Weisenheim am Sand; Verena Baldinger, Heidelberg; Klaus Ruebsamen, Neustadt, and Josef Gries, Wachenheim, all of Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

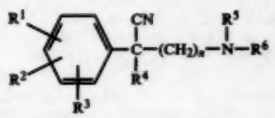
Filed Dec. 10, 1987, Ser. No. 130,954

Claims priority, application Fed. Rep. of Germany, Dec. 11, 1986, 3642331

Int. Cl.[5] C07D 121/75

U.S. Cl. 558—388 15 Claims

1. A basically substituted phenylacetonitrile of the formula



where

R^1, R^2 and R^3 are identical or different and are each hydrogen, halogen, trifluoromethyl, C_1–C_4-alkyl, nitro or

C_1–C_4-alkoxy, and two of the radicals R^1, R^2 and R^3 in adjacent positions may furthermore together form a methylenedioxy, ethylenedioxy, 1,3-dioxatetramethylene, propylene or butylene group,

R^4 is a saturated or unsaturated alkyl or cycloalkyl group of not more than 8 carbon atoms or phenyl,

R^5 is hydrogen or C_1–C_4-alkyl,

R^6 is a saturated or unsaturated hydrocarbon radical of 6 to 15 carbon atoms which may contain a nonaromatic ring, and

n is 2, 3 or 4, antipodes and physiologically tolerated acid addition salts thereof.

4,940,781

PEPTIDES COMPRISING AN IMMUNOGENIC SIDE OF POLIOVIRUS AND DNAS CONTAINING NUCLEOTIDE SEQUENCES CODING FOR THESE PEPTIDES

Marc Girard, and Sylvie Van Der Werf, both of Paris, France, assignors to Institut Pasteur, Paris, France

Continuation of Ser. No. 84,932, Aug. 13, 1987, abandoned, which is a division of Ser. No. 634,881, Jul. 27, 1984, Pat. No. 4,694,072. This application Jul. 21, 1988, Ser. No. 222,392

Claims priority, application France, Nov. 30, 1982, 82 20115; Jun. 29, 1983, 83 10778

The portion of the term of this patent subsequent to Sep. 15, 2005, has been disclaimed.

Int. Cl.[5] C07K *7/08, 7/10, 13/00*

U.S. Cl. 530—350 2 Claims

1. A polypeptide comprising an amino acid sequence: Asp Asn Pro Ala Ser Thr Thr Asn Lys Asp Lys Leu; and further comprising one or more additional amino acids attached to said amino acid sequence in the same sequence as said additional amino acids are attached to said amino acid sequence in another polypeptide having the sequence:

Ser	Arg	Asp	Ala	Leu	Pro	Asn	Thr	Glu	Ala
Ser	Gly	Pro	Thr	His	Ser	Lys	Glu	Ile	Pro
Ala	Leu	Thr	Ala	Val	Glu	Thr	Gly	Ala	Thr
Asn	Pro	Leu	Val	Pro	Ser	Asp	Thr	Val	Gln
Thr	Arg	His	Val	Val	Gln	His	Arg	Ser	Arg
Ser	Glu	Ser	Ser	Ile	Glu	Ser	Phe	Phe	Ala
Arg	Gly	Ala	Cys	Val	Thr	Ile	Met	Thr	Val
Asp	Asn	Pro	Ala	Ser	Thr	Thr	Asn	Lys	Asp
Lys	Leu	Phe	Ala	Val	Trp	Lys	Ile	Thr	Tyr
Lys	Asp	Thr	Val	Gln	Leu	Arg	Arg	Lys	Leu
Glu	Phe	Phe	Thr	Tyr	Ser.				

4,940,782

MONOCLONAL ANTIBODIES AGAINST IGE-ASSOCIATED DETERMINANTS, HYBRID CELL LINES PRODUCING THESE ANTIBODIES, AND USE THEREFORE

Bonita J. Rup, and Larry E. Kahn, both of St. Louis, Mo., assignors to G. D. Searle & Co., Chicago, Ill.

Filed Jun. 8, 1987, Ser. No. 59,749

Int. Cl.[5] C12N *5/20;* C07K *15/28;* A61K *39/00*

U.S. Cl. 530—387 2 Claims

1. The monoclonal antibody produced by hybridoma cell line ATCC HB 9436 which specifically binds to IgE and inhibits its binding of the IgE to a mast cell FcE receptor and which does not bind to IgE when IgE is bound to a mast cell FcE receptor, but does bind to IgE when IgE is bound to a B-cell FcE receptor.

4,940,783

DISAZO CONTAINING DIAMINOSTILBENE AS DIAZO COMPONENT AND AN ANILINE COUPLING COMPONENT BEARING A CATIONIC ALKYL AMMONIUM GROUP

Willy Stingelin, Reinach, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

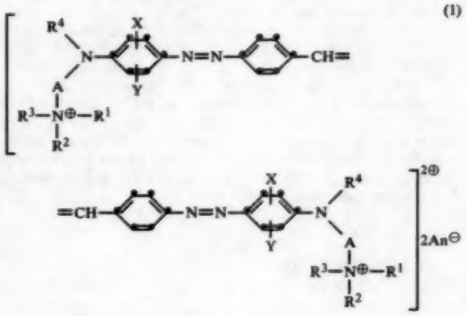
Filed Aug. 30, 1988, Ser. No. 238,637

Claims priority, application Switzerland, Sep. 3, 1987, 3374/87

Int. Cl.[5] C09B *44/02, 44/04, 44/08;* D06P *1/41*

U.S. Cl. 534—605 9 Claims

1. A disazo dye of the formula



(1)

in which

R^1, R^2, R^3 and R^4 independently of one another are each an unsubstituted alkyl radical, an alkyl radical which is substituted by hydroxy, cyano, phenyl or alkoxy or R_1 and R_2 together with the nitrogen atom linking them are a pyrrolidine, piperidine morpholine or piperazine radical, or R^1, R^2 and R^3 together with the nitrogen atom joining them are a pyridinium or triethylenediamine radical,

A is an alkylene radical having 2 to 6 C atoms,

X and Y independently of one another are hydrogen, halogen, C_1–C_4alkyl or C_1–C_4alkoxy which are unsubstituted or substituted by hydroxyl, halogen, cyano or C_1–C_4alkoxy and An^- is an anion.

4,940,784

METHOD FOR THE DRY CATIONIZATION OF GALACTOMANNANS (II)

Reinhard Stober, Hasselroth; Wolfgang Fischer, Kahl; Michael Huss, Eschborn, and Reimund Pieter, Wetzlar, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Aug. 2, 1988, Ser. No. 227,298

Claims priority, application Fed. Rep. of Germany, Aug. 13, 1987, 3726984

Int. Cl.[5] C08B *37/00*

U.S. Cl. 536—1.1 13 Claims

1. A method for the dry cationization of galactomannans comprising reacting a galactomannans with an alkylene epoxide in an alkaline medium in the presence of water, at a temperature of 5° to 60° C. in the presence of a finely divided, hydrophilic silica and a member of the group consisting of alkali metal silicates, alkali metal aluminates, alkali metal or alkaline earth metal hydroxides or oxides, alkali metal carbonates, and mixture thereof.

4,940,785

METHOD OF PREPARING CELLULOSE ETHERS CONTAINING TERTIARY OR QUATERNARY NITROGEN

Reinhard Stober, Hasselroth; Dietmar Bischoff, Marktbreit, and Michael Huss, Eschborn, all of Fed. Rep. of Germany, assignors to Degussa Aktiengesellschaft, Frankfurt, Fed. Rep. of Germany

Filed Oct. 4, 1988, Ser. No. 252,933

Claims priority, application Fed. Rep. of Germany, Oct. 3, 1987, 3733507

Int. Cl.[5] C08B *11/00, 11/02, 11/145, 11/193*

U.S. Cl. 536—90 12 Claims

1. A method of preparing cellulose ethers containing tertiary or quaternary nitrogen comprising reacting an alkylene epoxide with cellulose or derivatives of cellulose in an alkaline medium in the presence of water, wherein the reaction mixture contains 10 to 25% by wt. water in relation to its total amount, said reaction mixture appearing to be in a dry, powdery state.

4,940,786

ONE-POT PREPARATION OF BISMUTH (PHOSPH/SULF)ATED SACCHARIDES

Steven R. Duff, DeSoto, Kans., assignor to Marion Laboratories, Inc., Kansas City, Mo.

Filed Oct. 31, 1989, Ser. No. 429,460

Int. Cl.[5] C07H *11/00, 13/00, 23/00, 1/00*

U.S. Cl. 536—117 9 Claims

1. A process for preparing a bismuth (phosph/sulf)ated saccharide comprising steps of, first, contacting a component of a metal salt of a (phosph/sulf)ated saccharide with components of a bismuth substance and a water soluble organic acid having a pKa less than the pKa of a hydrogen (phosph/sulf-)ated saccharide generally corresponding to the bismuth (phosph/sulf)ated saccharide to be prepared, wherein, in said first step, the metal salt of a (phosph/sulf)ated saccharide is contacted first with the bismuth substance component, and then the mixture which results therefrom is contacted with said water soluble acid component, and second, maintaining contact of said components in the mixture provided by said first step, under conditions such that the bismuth (phosph/sulf-)ated saccharide is prepared.

4,940,787

PROCESS FOR THE CARBONYLATION OF ACETYLENIC UNSATURATED COMPOUNDS

Eit Drent, Amsterdam, Netherlands, assignor to Shell Oil Company, Houston, Tex.

Filed Nov. 25, 1987, Ser. No. 125,263

Claims priority, application Netherlands, Dec. 5, 1986, 8603100

Int. Cl.[5] C07H *1/00*; C07C *51/10, 51/14*

U.S. Cl. 536—124 33 Claims

1. A process for the preparation of an alpha,beta-olefinic unsaturated compound comprising the steps of contacting an acetylenic unsaturated compound with carbon monoxide in the presence of a hydroxyl-containing compound in liquid phase, in the presence of a catalytic system formed from:

(a) a palladium compound

(b) a protonic acid, and

(c) an organic phosphine according to the formula:

(I)

wherein R_1 is selected from the group consisting of a nitrogen-containing heterocyclic five-atom ring, a nitrogen-containing heterocyclic six-atom ring, a fused ring comprising at least one nitrogen-containing five-atom ring and a fused ring comprising at least one nitrogen-containing six-atom ring; wherein R_2 and R_3 are each R_1 or an aryl group.

4,940,788

PROCESS FOR PREPARING AZETIDINONES

Ian M. Cunningham, and David W. Heaton, both of Congleton, United Kingdom, assignors to Imperial Chemical Industries PLC, London, England

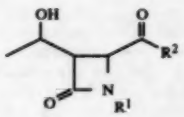
Filed Jan. 19, 1988, Ser. No. 145,818

Claims priority, application United Kingdom, Jan. 30, 1987, 8702139

Int. Cl.[5] C07D *303/04, 205/02*

U.S. Cl. 540—200 5 Claims

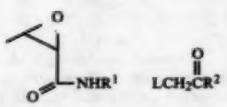
1. A process for preparing a compound of the formula (VII):



(VII)

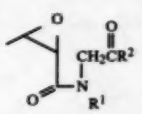
wherein R^1 is an amino-protecting group and R^2 is an alkyl or phenyl optionally substituted by C_{1-6} alkyl, C_{1-6} alkoxy, halogen or C_{2-6} alkoxycarbonyl, which process consists essentially of

reacting a compound of the formula (VIII) with a compound of the formula (IX)



(VIII) (IX)

wherein L is a halogen group under conditions such that a compound of formula (X) is formed; and



(X)

processing said compound of formula (X) under conditions such that said compound of formula (VII) is formed.

4,940,789

10,11-DIHYDRO-5-ALKYL-12-SUBSTITUTED-10,5-(IMINOMETHANO)-5H-DIBENZO[A,D]CYCLOHEPTENES AS NEUROPROTECTANT AGENTS

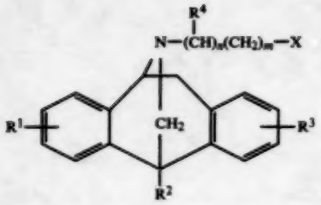
Wayne E. Childers, Jr., Yardley, and Magid A. Abou-Gharbia, Glen Mills, both of Pa., assignors to American Home Products Corporation, New York, N.Y.

Filed Oct. 10, 1989, Ser. No. 418,591

Int. Cl.[5] C07D *487/08*

U.S. Cl. 540—581 13 Claims

1. A compound of the formula:



in which

R^1 and R^3 are, independently, hydrogen, alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, hydroxy, cyano, nitro, halo, trifluoromethyl, amino, alkylamino of 1 to 6 carbon atoms or dialkylamino of 2 to 12 carbon atoms;

R_2 is alkyl of 1 to 6 carbon atoms;

R^4 is alkyl of 1 to 6 carbon atoms, phenyl or benzyl;

n is 0 or 1;

m is one of the integers 0, 1, 2, 3, 4, 5 or 6; and

X is alkyl of 1 to 6 carbon atoms, alkylamino of 1 to 6 carbon atoms, dialkylamino in which each alkyl group has 1 to 6 carbon atoms, alkanoyl of 2 to 6 carbon atoms or substituted or unsubstituted phenyl, pyridinyl, pyrimidinyl, pyrazinyl, quinolyl, morpholinyl, furyl, thienyl, pyrrolyl, tetrahydrofuryl, tetrahydrothienyl, pyrrolidinyl, piperidinyl, piperazinyl or perhydropyrimidinyl, in which the substituent is alkyl of 1 to 6 carbon atoms, alkoxy of 1 to 6 carbon atoms, halo, trifluoromethyl, cyano, nitro, or hydroxy;

or a pharmaceutically acceptable salt thereof.

4,940,790

5-(3-ALKYL-5-TERT.BUTYL-4-HYDROXYPHENYL)-2-AMINO-6H-1,3,4-THIADIAZINES

Werner Thorwart, Hochheim am Main; Ulrich Gebert, Kelkheim; Rudolf Schleyerbach, Hofheim am Taunus, and Robert R. Bartlett, Darmstadt, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

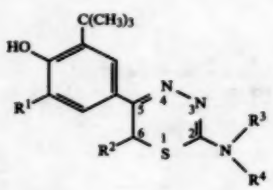
Filed Jan. 28, 1988, Ser. No. 149,601

Claims priority, application Fed. Rep. of Germany, Jan. 30, 1987, 3702756

Int. Cl.[5] C07D *285/16*

U.S. Cl. 544—8 **3 Claims**

1. A 5-(3-alkyl-5-tert.butyl-4-hydroxyphenyl)-2-amino -6H-1,3,4-thiadiazine of the formula I



(I)

in which

R^1 is a straight-chain or branched alkyl group having 1 to 4 carbon atoms,

R^2 is a hydrogen atom or an alkyl radical having 1 to 3 carbon atoms,

R^3 and R^4, independently of one another, represent a straight-chain or branched (C_1–C_6)alkyl, (C_3–C_6)-alkenyl or (C_3–C_6)-alkynyl group which can be substituted by phenyl or halogen, (C_1–C_3)alkyl- or (C_1–C_3)alkoxy-substituted phenyl, hnydroxyl or (C_1–C_4)acyloxy and/or whose C—C sequence may be interrupted by a heteroatom in the form of oxygen or sulfur, it also being possible for one of the two radicals to denote a hydrogen atom, or

R^3 and R^4, together with the nitrogen atom to which they are bound, form a 4- to 7-membered ring which may monosubstituted or polysubstitituted by (C_1–C_4)alkyl and/or contains, in place of one of the ring carbon atoms, a further heteroatom in the form of oxygen, sulfur or nitrogen to form a pyrrolidine, piperidine, morpholine, thiomorpholine or piperazine ring, it also being possible for the further nitrogen heteroatom of piperazine to carry an alkyl group having 1 to 3 carbon atoms or a phneyl radical in place of hydrogen, or a physiologically acceptable acid-addition salt thereof.

4,940,791

PROCESS FOR THE PRODUCTION OF PHTHALAZINEACETIC ACID ESTER DERIVATIVES AND A NOVEL HYDRAZINE CONTAINING INTERMEDIATE

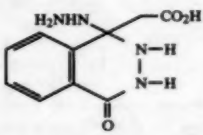
Terry G. Sinay, Jr., and Robert J. Sysko, both of Groton, Conn., assignors to Pfizer Inc., New York, N.Y.

Division of Ser. No. 161,540, Feb. 29, 1988. This application Dec. 6, 1989, Ser. No. 446,949

Int. Cl.[5] C07D *237/32, 237/34*

U.S. Cl. 544—237 **1 Claim**

1. A compound of the formula



(I)

4,940,792

HERBICIDAL SULFONYLUREAS

Werner Töpfl, Dornach; Willy Meyer, Riehen, both of Switzerland, and Hans-Dieter Schneider, Weil am Rhein, Fed. Rep. of Germany, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

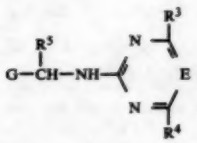
Division of Ser. No. 53,912, May 26, 1987, Pat. No. 4,764,203, which is a division of Ser. No. 699,388, Feb. 7, 1985, Pat. No. 4,685,961. This application Dec. 4, 1987, Ser. No. 128,761

Claims priority, application Switzerland, Feb. 14, 1984, 720/84; Apr. 12, 1984, 1841/84

Int. Cl.[5] C07D *239/42, 401/12, 403/12, 413/12*

U.S. Cl. 544—321 **10 Claims**

1. An N-pyrimidinyl-methylamine of the formula



wherein

G is selected from R^6 and $R^9S(O)_m$

m is 0 or 2

E is —CH=,

R^3 is halogen, C_1–C_4alkyl, C_1–C_4alkoxy, C_1–C_4haloalkyl, C_1–C_4haloalkoxy, C_2–C_4alkoxyalkyl, C_2–C_4alkoxyalkoxy, cyclopropyl, —NH_2, C_1–C_4alkylamino or di(C_1–C_4alkyl)amino,

R^4 has the same meaning as R^3 but independently thereof,

R^5 is hydrogen or C_1–C_4alkyl,

R^6 is a 5- to 7-membered heterocyclic radical which is bound through the nitrogen atom and which may be fused to a benzene ring, which is selected from among 1,2,4-triazole, benztriazole, benzimidazole, carbazole, indole, imidazole

and pyrazole, which is unsubstituted or substituted by one or more members selected from the group consisting of nitro, halogen, and C_1–C_4alkyl,

R^9 is C_1–C_4alkyl which is unsubstituted or substituted by halogen, C_2–C_4alkoxy, carboxyl, C_1–C_4alkoxycarbonyl or —$CONR^{10}R^{11}$, or is a phenyl, benzyl or naphthyl radical, each of which is unsubstituted or substituted by one or more identical or different members selected from the group consisting of halogen, nitro, carboxyl, C_1–C_4alkyl, C_1–C_4haloalkyl, C_1–C_4alkoxy or C_1–C_4haloalkoxy, and R^9 can also be a radical selected from —CZ—C_1–C_4alkyl, —CZO—C_1–C_4alkyl, —$CZNR^{10}R^{11}$, —CZ-phenyl, CZ-benzyl or CZ-naphthyl, wherein the phenyl rings may be substituted as indicated above,

R^{10} and R^{11}, each independently of the other, are hydrogen, C_1–C_4alkyl, C_3–C_4alkenyl, C_3–C_4alkynyl, C_1–C_4cyanoalkyl, or one of R^{10} and R^{11} may also be C_1–C_4alkoxy or C_2–C_4alkoxyalkyl, phenyl or benzyl, and the penyl ring may be substituted by one or more identical or different members selected from the group consisting of halogen, nitro, C_1–C_4haloalkyl or C_1–C_4alkoxy; or R^{10} and R^{11}, together with the nitrogen atom to which they are attached, may also be a 5- to 7-membered saturated heterocycle selected from among pyrrolidine, piperidine, morpholine and azepine and which are unsubstituted or substituted by halogen or C_1–C_4alkyl and

Z is oxygen or sulfur.

4,940,793

PHARMACOLOGICALLY ACTIVE PIPERAZINO DERIVATIVES

Francesco Botrè, Rome, and Roberto Signorini, Milan, both of Italy, assignors to Ravizza S.p.a., Milan, Italy

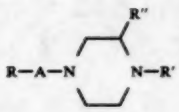
Filed Jul. 18, 1985, Ser. No. 756,257

Claims priority, application Italy, Aug. 14, 1984, 22334 A/84

Int. Cl.[5] C07D *487/04, 295/10, 295/22*

U.S. Cl. 544—349 **1 Claim**

1. A piperazino compound of the formula



in which:

A is CO, CH_2 or SO_2;

R is 2-methoxy-5-sulphamoyl-phenyl, 2-sulphamoylimidazyl, 2-amino-1,3,4-thiadiazole or 2-acetamido-1,3,4-thiadiazole;

R′ is H, linear or branched C_1–C_6 alkyl; linear or branched C_2–C_6 alkenyl; alkyl-phenyl or alkenyl-phenyl, wherein phenyl is optionally monosubstituted with halogen, trihalomethyl, C_1–C_6 alkyl, C_1–C_6 alkoxy, or sulphonamido; C_2–C_6 aliphatic acyl; C_3–C_6 alkylcarboxyalkoxy; alkylcarboxyamino in which the alkyl is C_1–C_3 and the amine is mono or disubstituted by linear or branched C_1–C_6 alkyl and;

R″ is H, or together with R′ forms a 5 or 6 membered ring condensed with the piperazine;

provided that when R is a substituted phenyl group and A is CO, R′ is other than H, C_1–C_4 alkyl or benzyl.

4,940,794

QUINOLINE CARBOXYLIC ACID BORIC ACID ANHYDRIDES

István Hermecz; Géza Kereszturi; Lelle Vasvári; Ágnes Horvath, all of Budapest; Mária Halogh, Dunakeszi; Péter Ritli, Budapest; Judit Sipos, Budapest; Anikó Pajor, Budapest, and Katalin Mármarosi, Bidatorbágy, all of Hungary, assignors to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara/Rt., Budapest, Hungary

PCT No. PCT/HU88/00018, § 371 Date Dec. 2, 1988, § 102(e) Date Dec. 2, 1988, PCT Pub. No. WO88/07998, PCT Pub. Date Oct. 20, 1988

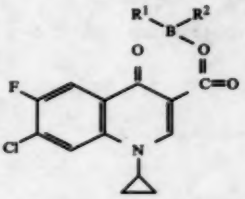
PCT Filed Apr. 8, 1988, Ser. No. 290,167

Claims priority, application Hungary, Apr. 8, 1987, 1504/87; Jun. 24, 1987, 2857/87; Jul. 10, 1987, 3147/87

Int. Cl.[5] C07F *5/02*

U.S. Cl. 546—13 **2 Claims**

1. A compound of the Formula (I)



wherein

R^1 and R^2 are each halogen, or an aliphatic acyloxy group containing 1 to 4 carbon atoms optionally substituted by halogen, or an aromatic acyloxy group containing 7 to 11 carbon atoms.

4,940,795

HETEROCYCLIC SPIRO COMPOUNDS AND METHODS FOR PREPARING THE SAME

Shin-ichi Tsukamoto; Hitoshi Nagaoka, both of Tokyo; Shinji Usuda, Ibaragi; Masatomi Harada, and Toshinari Tamura, both of Saitama, all of Japan, assignors to Yamanouchi Pharmaceutical Co., Ltd., Tokyo, Japan

Filed Oct. 5, 1988, Ser. No. 254,375

Claims priority, application Japan, Oct. 5, 1987, 62-252104; Nov. 12, 1987, 62-286297; Apr. 5, 1988, 63-84327

Int. Cl.[5] C07D *405/02*

U.S. Cl. 546—16 **2 Claims**

1. 2,8-Dimethyl-3-methylene-1-oxa-8-azaspiro[4,5]decane.

4,940,796

S,6-SUBSTITUTED-4-AMINOPYRIDINES AND THEIR CORRESPONDING INTERMEDIATES

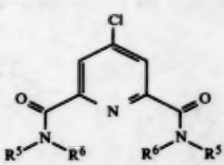
Lon J. Mathias, and Gustavo Cei, both of Hattiesburg, Miss., assignors to The University of Southern Mississippi, Hattiesburg, Miss.

Filed Mar. 17, 1989, Ser. No. 324,817

Int. Cl.[5] C07D *471/08, 213/81*

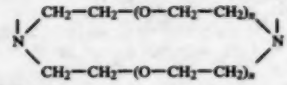
U.S. Cl. 546—323 **6 Claims**

5. A compound of the formula

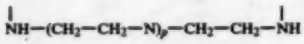


wherein R^5 and R^6 are independently C_{1-20} alkyl unsubstituted

or substituted with C_{1-3} alcohol or phenyl, hydroxy, $-(CH_2)_{1-3}COOH$, $-CHR^7COOH$ wherein R^7 is C_{1-5} alkyl or C_{1-5} alkyl substituted with hydroxy, amino, or carboxy, or allyl unsubstituted or substituted with a C_{1-4} alkyl or phenyl or together R^5 and R^6 with the two nitrogen atoms form a fused ring having the formula



wherein n is 1 or 2, or form a fused ring having the formula



wherein p is an integer from 0 to 3.

6. The compound of claim 5 wherein R^5 and R^6 are independently C_1–C_4 alkyl.

4,940,797

PROCESS FOR SYNTHESIS OF FK-506 C10–C18 INTERMEDIATES

Todd K. Jones, Edison; Sander G. Mills, Woodbridge, and Richard Desmond, Metuchen, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

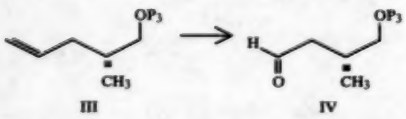
Filed Mar. 23, 1989, Ser. No. 327,848

Int. Cl.[5] C07D 263/04; C07C 41/00, 41/12, 43/00

U.S. Cl. 548—110 5 Claims

1. A process comprising the steps of:

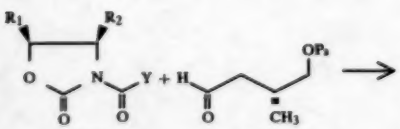
(a) contacting III with an oxidizing agent in an inert solvent and of a temperature in the range of 0 to 50° C. for a



III IV

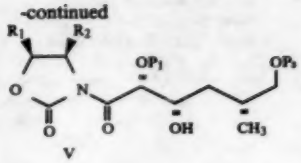
sufficient time to form the oxidation product IV, where P_3 is a hydroxy protecting group;

(b) contacting IV with a solution of a chiral N-acyloxazolidinone XIV, where Y is Protected oxymethyl, which is stable under the reaction conditions, and trialkylamine, and dialkylboron trifluoroalkylsulfonate under an inert atmosphere in an inert solvent and at a temperature in the range of −100° to 25° C. for a sufficient time to form the aldol addition product V, wherein R_1 and R_2 are independently chosen from H, C_1–C_4 linear or branched alkyl, benzyl, phenyl, which may be substituted with halo or C_1–C_4 alkoxy, with the proviso that R_2 is not H,



XIV IV

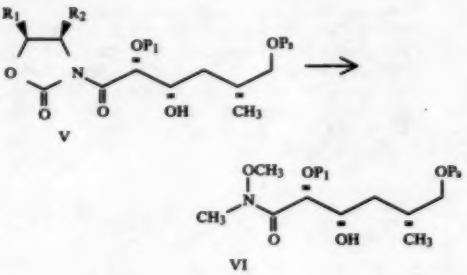
-continued



V

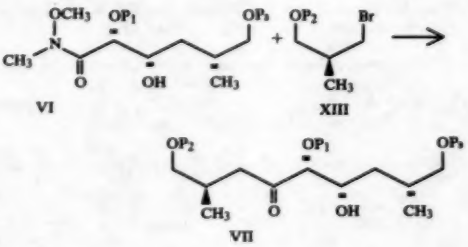
and where P_1 is a hydroxy protecting group which may be the same or different than P_3;

(c) contacting V with a solution of trialkylaluminum and N,O-dimethylhydroxylamine hydrochloride in an inert solvent and at a temperature in the range of −30° to 20° C. for a sufficient time to form the amide VI;



V VI

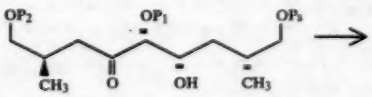
(d) contacting VI with XIII in the presence of lithium in an inert solvent therefor at a temperature in the range of −100° to 25° C., followed



VI XIII VII

by contacting the resulting mixture with aqueous ammonium halide at a temperature in the range of −20° to 25° C. for a sufficient time to form the condensation product VII where P_2 is a hydroxy protecting group, which may be the same as P_1 but is different from P_3;

(e) contacting VII with tetraalkylammonium tri-acetoxy borohydride and a weak organic acid in an inert solvent and at a temperature of about −40° to 25° C., for a sufficient time to form the reduction product VIII;



VII

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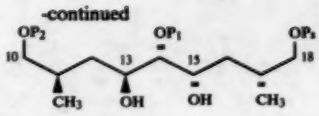
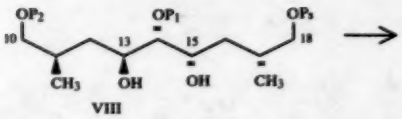
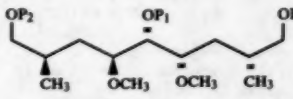


VIII

(f) Contacting VIII with an alkali metal hydride and a methylating agent under anhydrous conditions in an inert atmosphere in an inert solvent and at a temperature in the range of 0° to 50° C. for a sufficient time to form the methylated product IX;



VIII



IX

4,940,798

SUBSTITUTED AZOLYLVINYL KETONES AND CARBINOLS AS FUNGICIDES AND PLANT GROWTH REGULATORS

Hans-Ludwig Elbe; Wolf Reiser; Erik Regel, all of Wuppertal; Karl H. Büchel, Burscheid; Paul Reinecke, Leverkusen; Wilhelm Brandes, Leichlingen; Klaus Lürssen, Bergisch-Gladbach, and Paul-Ernst Frohberger, Leverkusen, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

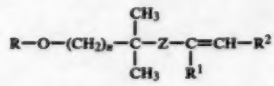
Division of Ser. No. 754,788, Jul. 12, 1985, Pat. No. 4,728,356, which is a division of Ser. No. 518,866, Aug. 1, 1983, abandoned. This application Sep. 24, 1987, Ser. No. 100,650

Claims priority, application Fed. Rep. of Germany, Aug. 5, 1982, 3229274

Int. Cl.[5] C07D *249/08, 233/60*

U.S. Cl. 548—268.4 **3 Claims**

1. Azolyl-pentene derivative of the formula



in which

R is C_1–C_{10}—alkyl,

R^1 is imidazol-1-yl or 1,2,4-triazol-1-yl,

R^2 is phenyl, 2-fluorophenyl, 4-fluorophenyl, 2-chlorophenyl, 3-chlorophenyl, 4-chlorophenyl, 2,4-dichlorophenyl, 3,4-dichlorophenyl or 2,4-dichlorophenyl,

Z is

or

and

n is o or 1,

and its addition salt with an inorganic or organic acid.

4,940,799

PREPARATION OF THE DIASTEREOMERIC MIXTURE 2R,4S-1-[2-(2,4-DICHLOROPHENYL)-4-N-PROPYL-1,3-DIOXOLAN-2-YLMETHYL]-1H-1,2,4-TRIAZOLE

Rudolf Aebi, Basel; Adolf Hubele, Magden, and Jürg Speich, Basel, all of Switzerland, assignors to Ciba-Geigy Corporation, Ardsley, N.Y.

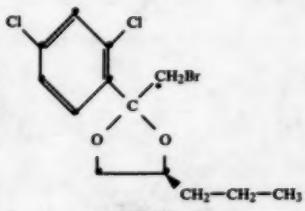
Filed Jul. 13, 1988, Ser. No. 218,189

Claims priority, application Switzerland, Jul. 20, 1987, 2746/87

Int. Cl.[5] C07D *407/06*

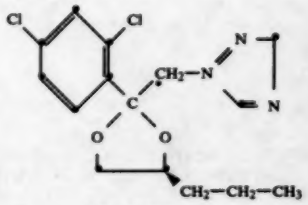
U.S. Cl. 548—268.8 **5 Claims**

1. A process for the preparation of the 2RS,4S-diastereoisomeric mixture of formula Ia and the 2R,4S-isomer of formula I of 1-[2-(2,4-dichlorophenyl)-4-n-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole, which comprises condensing 2',4'-dichloro-2-bromoacetophenone with S-1,2-pentanediol to give the diastereoisomeric mixture 2RS,4S-2-2-(2,4-dichlorophenyl)-2-bromomethyl-4-n-propyl-1,3-dioxolane of formula III, and reacting the latter with 1,2,4-triazole of formula IV



(III) 2RS,4S

(IV)



(Ia) (2RS,4S)

in a solvent at from 10 to 160° C., in the presence of a base as acid acceptor, to give the diastereoisomeric mixture 2RS,4S-1-[2-(2,4-dichlorophenyl)-4-n-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole of formula Ia and isolating it, or, if desired, separating the 2R,4S-isomer of 1-[2-(2,4-dichlorophenyl)-4-n-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole of formula I from the 2S,4S-1-[2-(2,4-dichlorophenyl)-4-n-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole diastereoisomer and isolating it.

4,940,800

BEAZIMIDAZOLE COMPOUNDS ACTIVE AS INHIBITORS OF THE CHOLESTEROL BIOSYNTHESIS

Giorgio Bertolini, Sesto San Giovanni; Cesare Casagrande, Arese, and Francesco Santangelo, Milano, all of Italy, assignors to Zambon Group S.p.A., Vicenza, Italy

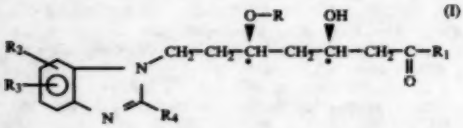
Filed Jul. 27, 1989, Ser. No. 385,369

Claims priority, application Italy, Jul. 29, 1988, 21542 A/88

Int. Cl.[5] C07D *235/18, 407/06*

U.S. Cl. 548—327 **3 Claims**

1. A compound of formula



(I)

wherein

R represents a hydrogen atom;

R_1 represents a hydroxy or an OR_5 group where R_5 represents a C_1–C_4 alkyl or benzyl;

or, R and R_1 together are a single bound between the oxygen and carbonyl;

R_2, R_3 and R_4 equal to or different from each other, represent hydrogen atoms, C_1–C_5 alkyl or alkoxy, halogen atoms, CF_3, phenoxy, benxyloxy, amino, mono or dialkylamino having 1 to 4 carbon atoms in the alkyl moiety;

the carbon atoms marked by an asterisk have contemporaneously R or S configuration; or

when R_1 is hydroxy, the salt thereof with a pharmaceutically acceptable base.

4,940,801

SPIRODILACTAM DERIVATIVES

Pen C. Wang, Houston, Tex., assignor to Shell Oil Company, Houston, Tex.

Continuation-in-part of Ser. No. 314,512, Feb. 23, 1989, Pat. No. 4,885,351. This application May 24, 1989, Ser. No. 356,158

Int. Cl.[5] C07D *487/10*

U.S. Cl. 548—410 **49 Claims**

1. A substituted 1,6-diaza 4.4]spirodilactam having an unsaturated substituent on each spiro ring nitrogen atom, which unsaturation is terminal, hydrocarbyl and is separated from the nitrogen atom to which the substituent is attached by one carbon atom or by an aromatic ring.

4,940,802

4,4'-BIS(PHTHALIMIDO)DIPHENYL SULFONE COMPOUNDS, PROCESSES FOR THEIR PRODUCTION AND FLAME RETARDANT POLYMER COMPOSITIONS CONTAINING THEM

Takao Matsuba, Shin-nanyo; Masashige Kubo, Tokuyama; Takumi Kagawa, Shin-nanyo; Kiyotaka Oyama, Hikari, and Koji Kawabata, Shin-nanyo, all of Japan, assignors to Tosoh Corporation, Shin-nanyo, Japan

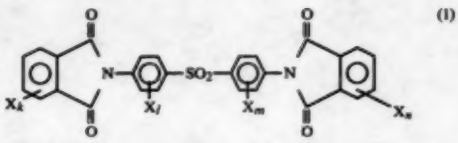
Filed Dec. 8, 1988, Ser. No. 281,045

Claims priority, application Japan, Dec. 8, 1987, 62-308768; Dec. 8, 1987, 62-308771; Jul. 27, 1988, 63-185387

Int. Cl.[5] C07D *209/48*

U.S. Cl. 548—462 **10 Claims**

1. A 4,4'-bis(phthalimido)diphenyl sulfone compound having the formula:



(I)

wherein X is a halogen atom, k=0 to 4, l=0 to 4, m=0 to 4 and n=0 to 4, provided k+l+m+n>1.

4,940,803

PROCESS FOR SYNTHESIS OF 1R,2R,5R-2-HYDROXY-6-OXO-7-OXABICYCLO[3.2.1]-OCTANE

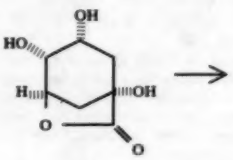
Sander G. Mills, Woodbridge; Ralph P. Volante, East Windsor, and Ichiro Shinkai, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed May 23, 1988, Ser. No. 197,551

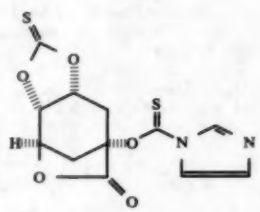
Int. Cl.[5] C07D *307/77*

U.S. Cl. 549—302 **7 Claims**

1. A process comprising the steps of:

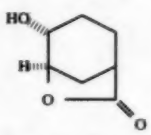


1



2

(a) contacting quinic acid lactone 1 with thiocarbonyldiimidazole at a temperature of 70° to 80° C. in an inert anhydrous organic solvent under an inert atmosphere for a sufficient time to yield dithiocarbonyl product 2;



3

(b) contacting product 2 from step (a) with a trihydrocarbyl hydride, an azobisalkylnitrile in an inert anhydrous organic solvent at a temperature of 125° to 140° C., under an inert atmosphere, for a sufficient time to form 3.

4,940,804

MICROBICIDES

Bettina Böhlendorf, Braunschweig; Norbert Bedorf, Königslutter; Gerhard Höfle; Dietmar Schummer, both of Braunschweig, all of Fed. Rep. of Germany, and Marius Sutter, Basel, Switzerland, assignors to Gesellschaft für Biotechnologische Forschung mbH and Ciba-Geigy Corporation, Ardsley, N.Y.

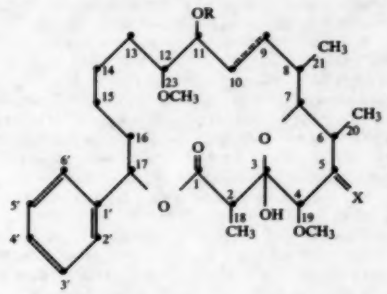
Filed Sep. 8, 1989, Ser. No. 405,379

Claims priority, application Switzerland, Sep. 9, 1988, 3376/88

Int. Cl.[5] C07D *321/00*

U.S. Cl. 549—267 **9 Claims**

1. Macrocyclic compound of the formula I



(I)

in which the dotted line in the 9,10-position is a saturated bond or a double bond, alternatively, while

R is hydrogen, CH_3 or —COA, where

A is hydrogen, C_3–C_6cycloalkyl or C_1–C_6alkyl which is unsubstituted or substituted by halogen or C_1–C_3alkoxy, and

X is oxygen or one of the groups =N—OY or =N—N(R_1)(R_2), where

Y is hydrogen, C_1–C_6alkyl, C_3–C_6alkenyl, C_3–C_6alkynyl or an acyl group —CO—Z in which

Z is phenyl, or a C_1–C_6alkyl group which is substituted by halogen or C_1–C_4alkoxy, or is hydrogen, C_1–C_6alkyl, C_2–C_6alkenyl or C_2–C_6alkynyl;

R_1 is hydrogen or C_1–C_6alkyl and

R_2 is hydrogen, C_1–C_6alkyl, phenyl, carbamoyl(=$CONH_2$), —COA or —SO_2—R_3, where

R_3 is C_1–C_6alkyl or is phenyl which is unsubstituted or substituted by C_1–C_4alkyl;

with the proviso that R is methyl if there is a double bond in the 9,10-position.

4,940,805

PREPARATION OF 1,4-BUTANEDIOL OR TETRAHYDROFURAN OR BOTH

Rolf Fischer, Heidelberg; Hans-Juergen Gosch, Bad Durkheim; Wolfgang Harder, Weinheim; Klaus-Dieter Malsch, Schifferstadt; Manfred Eggersdorfer, Frankenthal; Lothar Franz, Ludwigshafen; Horst Zimmermann, Heidelberg; Karl Brenner, Ludwigshafen; Klaus Halbritter, Mannheim, all of Fed. Rep. of Germany; Wolfgang Sauer, Everberg, Belgium, and Hans-Juergen Scheiper, Mutterstadt, Fed. Rep. of Germany, assignors to BASF Aktiengesellschaft, Ludwigshafen, Fed. Rep. of Germany

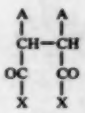
Filed Aug. 8, 1988, Ser. No. 230,015

Claims priority, application Fed. Rep. of Germany, Aug. 8, 1987, 3726509; Aug. 8, 1987, 3726510

Int. Cl.[5] C07D *307/08, 307/32*; C07C *27/04*

U.S. Cl. 549—326 **10 Claims**

1. In a process for the preparation of at least one of the compounds 1,4-butanediol, tetrahydrofuran and gamma-butyrolactone by catalytic hydrognenation of a compound of the formula



wherein each A is hydrogen or when taken together denote a single bond and each X is hydroxyl or alkoxy of from 1 to 6 carbon atoms or when taken together denote a ring oxygen atom —O—, at temperatures of from 100° C. to 350° C. and under pressures of from 50 bar to 350 bar, the improvement which comprises:

using a hydrogenation catalyst which contains cobalt and at least one of the elements copper, phosphorus and molybdenum.

4,940,806

MICROBICIDES

Adolf Hubele, Magden, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

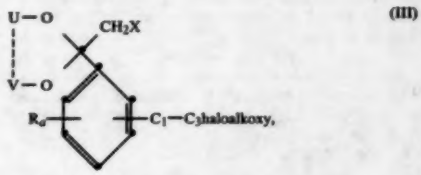
Division of Ser. No. 931,289, Nov. 17, 1986, Pat. No. 4,853,399. This application Jun. 21, 1989, Ser. No. 369,563

Claims priority, application Switzerland, Nov. 22, 1985, 4985/85

Int. Cl.[5] C07D *319/06, 319/08, 317/16*

U.S. Cl. 549—365 **1 Claim**

1. A compound of formula III

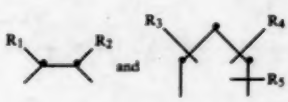


(III)

wherein one of the two phenyl substituents is in 2-position and the other is in 4-position, and wherein

R_o is halogen, methyl or C_1–C_3haloalkoxy,

U and V both taken together are an alkylene bridge selected from



R_1 and R_2 are each independently of the other hydrogen, C_1–C_6alkyl, C_1–C_6alkyl which is substituted by one or more halogen atoms, or are phenyl or phenyl which is substituted by one or more halogen atoms and/or C_1–C_2alkyl groups or are the group —CH_2—Z—R_6; or R_1 and R_2 together form a tetramethylene bridge which is unsubstituted or substituted by C_1–C_4alkyl; and

Z is an oxygen or sulfur atom,

R_6 is hydrogen, C_1–C_6alkyl or C_1–C_6alkyl which is substituted by one or more halogen atoms or C_1–C_3alkoxy groups, or is C_3–C_4alkenyl, 2-propynyl (=propargyl), 3-halo-2-propynyl, phenyl or benzyl, each unsubstituted or substituted in the aromatic ring by one or more of halogen, C_1–C_3alkyl, C_1–C_3alkoxy, nitro and CF_3;

R_3, R_4 and R_5 are each independently hydrogen or C_1–C_4alkyl, with the proviso that the total number of carbon atoms in R_3, R_4 and R_5 may not exceed 6;

and wherein X is halogen, benzenesulfonyloxy, p-tosloxy, trifluoroacetyloxy or lower alkylsulfonyloxy.

4,940,807

SELECTIVE BROMINATION OF AROMATIC COMPOUNDS USING POTASSIUM TRIBROMIDE

Robert N. DePriest, Columbia, S.C., assignor to Ethyl Corporation, Richmond, Va.

Filed Jun. 12, 1989, Ser. No. 365,209
Int. Cl.[5] C07D 317/62; C07C 43/225
U.S. Cl. 549—434 12 Claims

1. A process which comprises reacting a ring-brominatable electron-rich aromatic compound with potassium tribromide in the presence of water such that a product enriched in monobromo ring substitution is formed.

4,940,808

PROCESS FOR OZONIZATION OF UNSATURATED ORGANIC COMPOUNDS

Paul Schulz, Wuppertal, Fed. Rep. of Germany; Michael J. Virnig, Santa Rosa, Calif., and Franz J. Carduck, Haan, Fed. Rep. of Germany, assignors to Henkel Kommanditgesellschaft auf Aktien, Duesseldorf-Holthausen, Fed. Rep. of Germany

Filed Jul. 7, 1988, Ser. No. 216,067
Claims priority, application Fed. Rep. of Germany, Jul. 8, 1987, 3722566
Int. Cl.[5] C07D 317/54; C07C 55/14, 51/31, 61/04
U.S. Cl. 549—436 21 Claims

1. A process for ozonization of an unsaturated organic compound which comprises: passing through a zone maintained under ozonization conditions a mixture containing an unsaturated organic compound, a protic solvent capable of dissolving the unsaturated organic compound and ozonization products thereof, an ozone containing material and a coolant having a boiling point in the range of from about +20° C. to about −200° C. to dissipate the heat of reaction which has a boiling point below the temperature maintained in said ozonization zone, and separating a stream containing ozonization product from said zone.

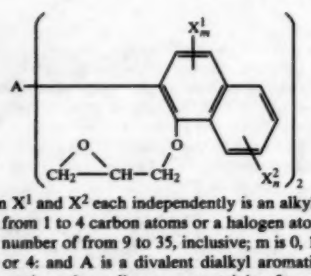
4,940,809

BIS-ANTHROLS AND BIS-NAPHTHOLS AND DIGLYCIDYL ETHERS THEREOF

Kenneth C. Dewhirst, and Thomas G. Stewart, Jr., both of Houston, Tex., assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 107,618, Oct. 9, 1987, Pat. No. 4,847,011.
This application Feb. 6, 1989, Ser. No. 306,413
Int. Cl.[5] C07D 303/08
U.S. Cl. 549—559 7 Claims

1. A diglycidyl ether of a bis-naphthol of the formula IIa



IIa

wherein X^1 and X^2 each independently is an alkyl group containing from 1 to 4 carbon atoms or a halogen atom having an atomic number of from 9 to 35, inclusive; m is 0, 1 or 2, n is 0, 1, 2, 3 or 4; and A is a divalent dialkyl aromatic or dialkyl non-aromatic carbocyclic group containing from 7 to 24 carbon atoms in which each alkyl group contains from 1 to 8 carbon atoms and the carbocyclic group comprises a central non-aromatic ring containing 5 to 7 carbon atoms in a ring or a central aromatic carbocyclic ring, each central ring may be bridged or fused with a non-aromatic or aromatic carbocyclic ring.

4,940,810

PROCESS FOR PRODUCING SILICON-CONTAINING AROMATIC POLYACIDS

Howard B. Yokelson, Aurora; Walter Partenheimer, Naperville, and Robert Gipe, Wheaton, all of Ill., assignors to Amoco Corporation, Chicago, Ill.

Filed Dec. 15, 1989, Ser. No. 451,412
Int. Cl.[5] C07F 7/08, 7/18
U.S. Cl. 556—438 6 Claims

1. A process for preparation of silicon-containing aromatic polyacids by liquid phase oxidation of an alkyl-substituted diaryldialkylsilane wherein alkyl groups containing 1 to 20 carbon atoms in the alkyl-substituted diaryl group number from 1 to 4, and the number of carbon atoms is from 1 to 20 in the alkyl groups attached to the silicon of the silane group, which process comprises:

(a) introducing into a suitable reactor a feedstock comprising said alkyl-substituted diaryldialkylsilane in a solvent acid comprising an aliphatic C_2 to C_6 monocarboxylic acid;

(b) oxidizing said feedstock in the presence of a catalyst comprising cobalt-manganese-bromine with an oxygen-containing gas wherein the weight ratio of cobalt (calculated as elemental cobalt) to the alkyl-substituted diaryldialkylsilane is in the range of from about 0.2 to about 100 milligram atoms (mga) per gram mole of said alkyl-substituted diaryldialkylsilane, weight ratio of manganese (calculated as elemental manganese) to the cobalt of said catalyst is in the range of from about 0.2 to 100 milligram atoms (mga) per mga of cobalt, and weight ratio of bromine in said catalyst (calculated as elemental bromine) to total cobalt and manganese (calculated as elemental cobalt and manganese) is in the range of from about 0.25 to about 1.2 mga per mga of total cobalt and manganese, wherein weight ratio of said feedstock to said aliphatic C_2 to C_6 monocarboxylic acid is from about 1:5 to about 1:10, said feedstock to said acid, at a temperature within the range of from about 120° C. (250° F.) to about 260° C. (500° F.) and at a reaction pressure within the range of from about 50 psig to about 750 psig; and

(c) recovering a silicon-containing aromatic polyacid wherein said polyacid comprises a bis(mono- or polycarboxyaryl)dialkylsilane.

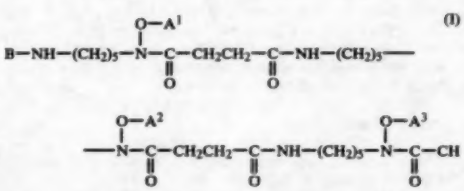
4,940,811

N,N-DISUBSTITUTED UREAS AND PROCESSES FOR THEIR MANUFACTURE

Heinrich Peter, Binningen, Switzerland, assignor to Ciba-Geigy Corporation, Ardsley, N.Y.

Filed Nov. 30, 1987, Ser. No. 126,981
Claims priority, application Switzerland, Dec. 9, 1986, 4907/86; Jul. 23, 1987, 2793/87
Int. Cl.[5] C07C 175/06
U.S. Cl. 558—262 29 Claims

1. A compound of the formula I



(I)

in which B represents a carbamoyl radical of the partial formula —CO—NH—Alk—CO—O—R_a^1 (II) in which R_a^1 represents C_1–C_4-alkyl or C_2–C_4-alkenyl and Alk represents

C_1–C_7-alkylene that is unsubstituted or substituted by hydroxy, C_1–C_4-alkanoyloxy, amino, C_1–C_4-alkoxycarbonyl, carbamoyl, phenyl, hydroxyphenyl, methoxyphenyl or by indolyl, and each of the symbols A^1, A^2 and A^3, independently of the others, represents hydrogen, an above-defined carbamoyl radical of the partial formula II, or an acyl radical Ac

(a) of the formula Z—C(=O)—, in which Z represents

(aa) hydrogen,

(ab) alkyl or alkenyl having up to 19 carbon atoms each of which is unsubstituted or substituted by carboxy, cyano, carbamoyl, (C_1–C_4)-alkoxycarbonyl, amino or halogen,

(ac) phenyl which is unsubstituted or substituted by one or two substituents selected from halogen, nitro, C_1–C_4-alkyl, hydroxy, C_1–C_4-alkoxy, phenoxy, methylenedioxy, carboxy, cyano and C_1–C_4-alkoxycarbonyl,

(ad) pyridyl, furyl, theinyl, imidazolyl, quinolyl, isoquinolyl, benzofuryl, benzimidazolyl,

(ae) benzyl or styryl, or

(af) di-lower alkylamino; or

(b) of the formula R^o—O—CO wherein R^o represents

(ba) C_1–C_{20}-alkyl which is unsubstituted or substituted by cyano, carboxy, carbamoyl, (C_1–C_4)-alkoxycarbonyl or benzyloxycarbonyl,

(bb) C_2–C_{20}-hydroxyalkyl in which the hydroxy group is in any position apart from the 1-position, or

(bc) linear (mono- or di- to hexa-)-oxaalkyl having from 4 to 20 chain members, wherein one or more of the carbon atoms, from C-3 on, of a linear C_4–C_{20}-alkyl have been replaced by oxygen atoms that are separated from one another by at least 2 carbon atoms;

or a salt of such a compound having salt-forming properties.

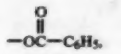
4,940,812

5-SUBSTITUTED AMINOPHENOLS

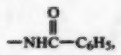
Philip T. S. Lau, Rochester, and Danny R. Thompson, Fairport, both of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 17, 1989, Ser. No. 380,347
Int. Cl.[5] C07C *147/13*
U.S. Cl. 560—12 **4 Claims**

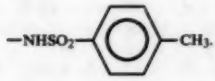
1. An aminophenol wherein the amino group and the hydroxy group are either ortho or meta to one another, and wherein the amino group has at least one hydrogen bonded to the amino nitrogen, and the third valence of said nitrogen is satisfied by bonding to hydrogen or an alkyl or aryl group having up to about 30 carbon atoms, and wherein the position para to said hydroxy group is unsubstituted or substituted with a coupling off group selected from the group consisting of —Cl, —F, —OCH_3, —OC_6H_5, —$OCH_2CONHCH_2CH_2OH$, —$OCH_2CONHCH_2CH_2OCH_3$, —$OCH_2CONHCH_2CH_2OCOCH_3$,



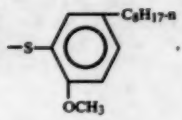
—$NHSO_2CH_3$,

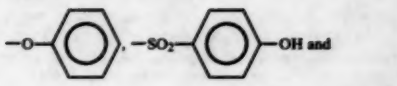


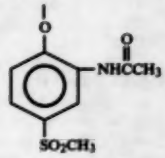
—OSO_2CH_3,



—$S(CH_2)_2COOH$,







, and the position para to the amino group is bonded to a carbon atom that is in turn bonded to (i) a hydrogen atom, (ii) a substituent selected from the class consisting of alkylthio, arylthio, alkylsufonyl, and arylsulfonyl groups wherein the alkyl and aryl groups have up to about 30 carbon atoms, and (iii) a group selected from carboxy and carboxy ester represented by COOR, wherein R is an alkyl or aryl radical having up to about 30 carbon atoms.

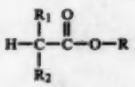
4,940,813

RESOLUTION OF A CARBOXYLIC ACID

Edward G. Corley, Old Bridge; Robert D. Larsen, Monmouth Junction; Edward J. J. Grabowski, Westfield, and Paul Reider, Westfield, all of N.J., assignors to Merck & Co., Inc., Rahway, N.J.

Filed Mar. 31, 1989, Ser. No. 331,145
Int. Cl.[5] C07C *69/612*; C07B *55/00*
U.S. Cl. 560—103 **22 Claims**

1. A process for the preparation of an optically active ester (V) or an enriched mixture therein:



(V)

wherein

R_1 and R_2 are independently selected from:

a. $C_{1\text{-}10}$ alkyl substituted with a group X;

b. $C_{6\text{-}10}$ aryl or $C_{7\text{-}11}$ araalkyl wherein the aryl moiety is substituted with a group X

c. $C_{5\text{-}8}$ cycloalkyl substituted with X;

d. $C_{2\text{-}10}$ alkenyl substituted with a group X;

e. $C_{2\text{-}10}$ alkynyl substituted with a group X;

f. $C_{1\text{-}5}$ alkyloxy;

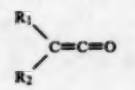
g. $C_{1\text{-}5}$ alkylthio; provided that R_1 and R_2 are not identical;

R is the organic radical of an α-hydroxy ester or α-hydroxy tertiary amide (ROH) (III);

X is H, $C_{1\text{-}6}$ alkyl, $C_{1\text{-}5}$ alkoxy, halogen, $C_{1\text{-}5}$ acyloxy, $C_{1\text{-}5}$ acylamino, $C_{1\text{-}5}$ acyl, trialkylsiloxy;

which comprises:

reacting a ketene of formula (II):



(II)

with an optically active α-hydroxy ester or α-hydroxy tertiary amide (ROH) (III) in a nonpolar solvent in the presence of up to 10 moles tertiary amine (IV) per mole ketene at a temperature between −80° and 25° C. to yield an optically active ester (V).

4,940,814

REACTION OF HEXAFLUOROPROPENE OXIDE WITH FLUORINATED CARBOXYLIC ACID FLUORIDES

Werner Schwertfeger, Langgöns, Fed. Rep. of Germany, assignor to Hoechst Aktiengesellschaft, Frankfurt am Main, Fed. Rep. of Germany

Filed Mar. 3, 1988, Ser. No. 163,691

Claims priority, application Fed. Rep. of Germany, Mar. 7, 1987, 3707367

Int. Cl.[5] **C07C** *51/58*

U.S. Cl. 562—849 **15 Claims**

1. A process for the preparation of halogenated carboxylic acid fluorides by reacting a carboxylic acid fluoride with hexafluoropropene oxide in the presence of a catalyst, which comprises reacting a carboxylic acid fluoride of the formula

R—COF (III)

in which is the group CCl_3 or $X—(CF_2)_n$, X representing a hydrogen atom, a bromine atom or a fluorosulfonate radical and n denoting an integer from 1 to 6, with hexafluoropropene oxide in the presence of a catalyst system comprising an alkali metal fluoride, a carboxylic acid dinitrile and at least one ether of the formula

$CH_3O—(CH_2CH_2O)_z—CH_3$ (V)

in which z denotes an integer from 2 to 6.

4,940,815

PROCESS FOR THE PRODUCTION OF THIOCARBOHYDRAZIDE

Dennis E. Jackman, Prairie Village, Kans.; Gary W. Combs, Blue Springs, Mo., and Dietmar B. Westphal, Remscheid, Fed. Rep. of Germany, assignors to Mobay Corporation, Pittsburgh, Pa.

Filed Mar. 17, 1989, Ser. No. 324,842

Int. Cl.[5] **C07C** *337/06*

U.S. Cl. 564—18 **10 Claims**

1. A process for the production of TCH comprising

(a) reacting carbon disulfide and excess hydrazine in the presence of a mercaptan and optionally a strong base or an amine other than hydrazine to form TCH,

(b) adding carbon disulfide in an amount which is at least sufficient to react with any unreacted hydrazine present and a strong base or an amine other than hydrazine to the reaction mixture of (a) if a strong base or an amine other than hydrazine was not present during (a) and

(c) heating the mixture of (b) to form TCH.

4,940,816

ACYLATED CYANAMIDE COMPOUNDS

Herbert T. Nagasawa, Richfield, Minn., and Chul-Hoon Kwon, Rochester, N.Y., assignors to Regents of the University of Minnesota, Minneapolis, Minn.

Division of Ser. No. 110,790, Oct. 21, 1987, Pat. No. 4,870,056, which is a division of Ser. No. 821,604, Jan. 23, 1986, Pat. No. 4,726,941. This application Jul. 19, 1989, Ser. No. 382,554

Int. Cl.[5] **C07C** *125/08*

U.S. Cl. 564—103 **2 Claims**

2. 1-Adamantoylcyanamide.

4,940,817

PROCESS FOR THE PREPARATION OF N-ALKYLANILINES

Günter Klug, Monheim; Hans-Josef Buysch, Krefeld, and Lothar Puppe, Burscheid, all of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

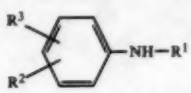
Filed Jan. 25, 1989, Ser. No. 301,672

Claims priority, application Fed. Rep. of Germany, Feb. 6, 1988, 3803662

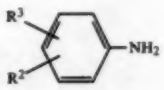
Int. Cl.[5] **C07C** *87/52, 88/02*

U.S. Cl. 564—305 **18 Claims**

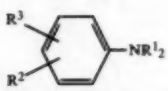
1. In a process for the preparation of N-alkylanilines of the formula



comprising reacting anilines of the formula



with N,N-dialkylanilines of the formula



wherein

R^1 denotes C_1–C_4-alkyl and

R^2 and R^3, independently of one another, stand for hydrogen, C_1–C_4-alkyl, C_1–C_4-alkoxy, fluorine, chlorine or bormine,

in the gas or liquid phase at elevated temperatures, the improvement wherein the reaction is carried out in the presence of zeolites at temperatures of 200° to 350° C.

4,940,818

PROCESS ON THE PREPARATION OF 2,2'-OXYBIS(N,N-DIMETHYL-ETHANAMINE)

Jürgen Weber, Oberhausen; Detlef Kampmann, Bochum; Franz Thönnessen, and Claus Kniep, both of Oberhausen, all of Fed. Rep. of Germany, assignors to Hoechst Aktiengesellschaft, Werk Ruhrchemie, Fed. Rep. of Germany

Filed Jun. 23, 1988, Ser. No. 210,634

Claims priority, application Fed. Rep. of Germany, Jun. 30, 1987, 3721538

Int. Cl.[5] **C07C** *85/02*

U.S. Cl. 564—471 **18 Claims**

1. In a process for the preparation of 2,2'-oxybis-[N,N-dimethylethanamine] by reacting 2,2'-oxybisethanamine with an oxygen containing compound and hydrogen at an elevated temperature and pressure on a fixed-bed catalyst, the improvement comprising using as the oxygen containing compound, formaldehyde with not more than 50% by weight of water present in the reaction mixture, the formaldehyde and amine being heated to the elevated temperature before being mixed together and the fixed-bed catalyst is a hydrogenation catalyst selected from the group consisting of Ni, Co, Cu, Mn, Fe, Rh, Pd and Pt containing catalysts and a reduced amount of water.

4,940,819

PROCESS FOR THE HYDROGENATION OF α,β-UNSATURATED KETONES

Wolfgang Kiel, Odenthal, and Heinz Ziemann, Leichlingen, both of Fed. Rep. of Germany, assignors to Bayer Aktiengesellschaft, Leverkusen, Fed. Rep. of Germany

Filed Jul. 5, 1989, Ser. No. 375,763

Claims priority, application Fed. Rep. of Germany, Jul. 20, 1988, 3824625

Int. Cl.[5] C07C 45/62

U.S. Cl. 568—318 17 Claims

1. A process for the catalytic hydrogenation of α,β-unsaturated ketones of the formula

$$R^1—CH=CH—CO—R^2,$$

in which

R^1 and R^2 independently of one another represent straight-chain or branched C_1–C_{12}-alkyl or C_2–C_{12}-hydroxyalkyl, straight-chain or branched C_2–C_{12}-alkenyl, C_3–C_8-cycloalkyl, C_3–C_8-cycloalkenyl, C_7–C_{14}-aralkyl or C_6–C_{12}-aryl, where at least one of the radicals R^1 and R^2 is monosubstituted to trisubstituted by halogen,

to give the respective saturated ketones of the formula

$$R^{11}—CH_2—CH_2—CO—R^{12},$$

in which

R^{11} and R^{12} assume the meaning of R^1 and R^2 with the exception that alkenyl and cycloalkenyl are hydrogenated to the respective alkyl or cycloalkyl,

wherein the hydrogenation is carried out in the presence of a Ni-containing catalyst and an organic sulphur compound of the formula

$$CH_3—CO—SH$$

or of the formula

$$R^3—S(=O)_n—R^4$$

in which

R^3 and R^4 independently of one another denote straight-chain or branched C_1–C_{12}-alkyl, hydroxy-C_2–C_{12}-alkyl, or carboxy-C_1–C_{12}-alkyl or phenyl, and furthermore

R^3 and R^4 together may represent —CH=CH—CH=CH—, $—(CH_2)_4—$, $—(CH_2)_5—$, $—(CH_2)_2—S—(CH_2)_2—$ or $—(CH_2)_2—O—(CH_2)_2—$,

R^4 may additionally denote hydrogen or CO—C_1–C_{12}-alkyl and

n assumes the value 0 or 1 and wherein the Ni-containing catalyst is Ni on supports, Ni in the form of elemental nickel sponge, Ni oxide or a Raney nickel.

4,940,820

WRAPAROUND RECOVERY ARTICLE

Kenneth B. Pithouse, L'Ermieage, France; Thomas A. Kridl, Union City; James T. Triplett, Livermore, both of Calif., and Marc Wille, Baal, Belgium, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Continuation of Ser. No. 891,420, Aug. 1, 1986, abandoned, which is a continuation of Ser. No. 567,126, Dec. 30, 1983, abandoned. This application Sep. 16, 1987, Ser. No. 97,376

Claims priority, application United Kingdom, Jan. 6, 1983, 8300223; Jul. 23, 1983, 8319855; Aug. 16, 1983, 8322004

Int. Cl.[5] D03D 3/02

U.S. Cl. 428—34.9 50 Claims

25. A heat-recoverable wraparound article which comprises a recoverable fabric cover portion, the fabric having a recovery ratio of at least 20%, and edge regions (8) provided with a mechanical closure (3,7,9) for maintaining the edge regions (8) in proximate relationship during recovery, wherein the article comprises a recoverable fabric in which recoverable fibres (6) run from the first edge region (8) to the second edge region (8), and at each said edge region (8) turn back around the closure elements (7) towards the other edge region (8), thus fixedly trapping the closure elements (7); and wherein the mechanical closure is selected from the group consisting of one or more discrete clamping elements which can hold together first and second closure elements at first and second edge regions of the article or the mechanical closure comprising first and second closure elements (3,7,9) provided on first and second edge regions respectively, the elements being interengageable by virtue of cooperating surfaces thereof.

4,940,821

PREPARATION OF FLUOROPHENOLS

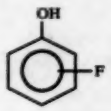
R. Garth Pews, and James A. Gall, both of Midland, Mich., assignors to The Dow Chemical Company, Midland, Mich.

Filed Mar. 20, 1989, Ser. No. 325,421

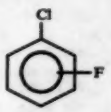
Int. Cl.[5] C07C 37/02, 39/27

U.S. Cl. 568—775 6 Claims

1. A process for preparing a fluorophenol of the formula



which comprises heating a chlorofluorobenzene of the formula



with water at a temperature from about 225° to about 300° C. in the presence of a copper-containing catalyst in either the cuprous or cupric oxidation state at a pH of from about 0.3 to about 6.5.

4,940,822

SUBSTITUTED BENZENEMETHANOL COMPOUNDS, INTERMEDIATES THEREOF, AND PREPARATION THEREOF

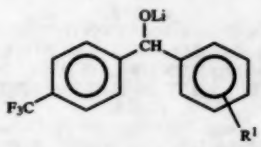
James G. Davidson, III, and Brian S. Swierenga, both of Holland, Mich., assignors to Warner-Lambert Company, Ann Arbor, Mich.

Filed Nov. 4, 1988, Ser. No. 267,428

Int. Cl.[5] C07C 33/46

U.S. Cl. 568—812 34 Claims

1. A compound of the formula:



wherein R^1 is selected from the group of hydrogen, halo substituted alkyl group, halo, nitro, alkyl group, aralkyl group, cycloalkyl group, aryl group, alkaryl group, heterocyclic group containing a member selected from the group of N, O, S, or mixtures thereof, alkoxy group, aryloxy group, thioalkoxy group, and N,N'-dialkylamino.

4,940,823

PROCESS FOR OPTICALLY ACTIVE 3-THIOLANYL SULFONATE ESTERS

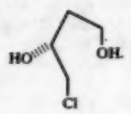
Robert A. Volkmann, Mystic, Conn., assignor to Pfizer Inc., New York, N.Y.

Division of Ser. No. 378,888, Jul. 12, 1989, Pat. No. 4,921,972, which is a continuation-in-part of Ser. No. 353,374, May 17, 1989, abandoned, which is a division of Ser. No. 308,868, Feb. 9, 1989, Pat. No. 4,864,046. This application Jan. 19, 1990, Ser. No. 467,820

Int. Cl.[5] C07C *31/34*

U.S. Cl. 568—844 1 Claim

1. An optically active compound of the formula



4,940,824

PROCESS FOR REMOVING VINYLIDENE CHLORIDE FROM 1,1-DICHLORO-1-FLUOROETHANE

Stephen F. Yates, Arlington Hts., Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 14, 1989, Ser. No. 450,654

Int. Cl.[5] C07C *17/38*

U.S. Cl. 570—179 4 Claims

1. A process for purifying 1,1-dichloro-1-fluoroethane (CFC-141b) containing about 200 to 900 wt.ppm vinylidene chloride comprising passing said 1,1-dichloro-1-fluoroethane over a carbon molecular sieve having a mean pore size between about 4.2 to 4.5 Angstroms at a temperature of −20° C. to 60° C. and a pressure of about 100 to 500 kPa and recovering 1,1-dichloro-1-fluoroethane containing less than 200 wt.ppm of vinylidene chloride.

4,940,825

PROCESS FOR REMOVING DICHLOROACETYLENE FROM 1,1-DICHLORO-1-FLUOROETHANE AND/OR VINYLIDENE CHLORIDE

Stephen F. Yates, Arlington Hts., Ill., assignor to Allied-Signal Inc., Morris Township, Morris County, N.J.

Filed Dec. 14, 1989, Ser. No. 451,266

Int. Cl.[5] C07C *17/38*

U.S. Cl. 570—179 6 Claims

1. A process for purifying 1,1-dichloro-1-fluoroethane (CFC-141b) containing about 4–20 wt. ppm by weight of dichloroacetylene comprising passing said 1,1-dichloro-1-fluoroethane over a carbon molecular sieve having a mean pore size between about 4.2 to 4.5 Angstroms at a temperature of about −20° C. to 60° C. and a pressure of about 100 to 500 kPa and recovering 1,1-dichloro-1-fluoroethane containing less than 2 ppm by weight of dichloroacetylene.

4,940,826

PROCESS FOR THE PRODUCTION OF MONO-OLEFINS BY THE CATALYTIC OXIDATIVE DEHYDROGENATION OF GASEOUS PARAFFINIC HYDROCARBONS HAVING TWO OR MORE CARBON ATOMS

Joseph J. Font Freide, Weybridge; Mark J. Howard, Twickenham, and Trevor A. Lomas, Langley, all of England, assignors to British Petroleum Company p.l.c., London, England

Filed Feb. 6, 1989, Ser. No. 306,063

Claims priority, application United Kingdom, Mar. 8, 1988, 8805447

Int. Cl.[5] C07C *5/333, 5/373*

U.S. Cl. 585—600 9 Claims

1. A process for the production of a mono-olefin from a gaseous paraffinic hydrocarbon having at least two carbon atoms or a mixture thereof, which process comprises partially combusting a mixture of the hydrocarbon or hydrocarbons and a molecular oxygen-containing gas in contact with a combustion catalyst selected from the group consisting of a platinum/cordierite monolith, platinum/mullite monolith and a metallic gauze containing a platinum group metal.

4,940,827

CATALYST SYSTEM FOR OLEFIN DISPROPORTIONATION

Frank J. Janssen; Coenraad H. Wilms; Donald Reinalda, and Hendrik W. Bruijn, all of Am Amsterdam, Netherlands, assignors to Shell Oil Company, Houston, Tex.

Division of Ser. No. 272,590, Nov. 17, 1988, Pat. No. 4,916,102. This application Nov. 16, 1989, Ser. No. 437,146

Claims priority, application United Kingdom, Nov. 18, 1987, 8726925

Int. Cl.[5] C07C *6/04*

U.S. Cl. 585—646 21 Claims

1. A process for olefin disproportionation using a catalyst system comprising molybdenum oxide supported on alumina prepared by a process which comprises:

(a) comulling a gamma alumina providing agent with a sulfur-containing compound and/or a phosphorus-containing compound to produce a homogeneous mass,

(b) extruding the mass and dividing it into small particles,

(c) drying and calcining said particles at a temperature in the range of from about 400° C. to about 800° C.

(d) subjecting said particles at least once to an additional step comprising: (1) impregnating said particles with a solution of molybdenum oxide(s), (2) drying and (3) calcining said impregnated particles at a temperature in the range of from about 400° C. to about 800° C.

4,940,828

STEAM CRACKING FEED GAS SATURATION

William C. Petterson, Missouri City; Thomas A. Wells, Houston; Peter Cherish, Kingwood, and Stephen W. Morgan, Spring, all of Tex., assignors to The M. W. Kellogg Company, Houston, Tex.

Filed Oct. 13, 1989, Ser. No. 420,856

Int. Cl.[5] C07C *4/02*

U.S. Cl. 585—652 3 Claims

1. A method of controlling the dilution steam for steam cracking gaseous hydrocarbons which comprises:

(a) circulating water upwardly through a tubular saturating zone and heating the water therein at a variably controlled rate by indirect heat exchange with a heating fluid;

(b) injecting a gaseous hydrocarbon feed into a lower, flooded portion of the tubular saturating zone in cocurrent flow with the circulating water;

(c) recovering a two phase, equilibrium mixture comprised of water and water-saturated hydrocarbon feed from the tubular saturation zone;

(d) introducing the two phase, equilibrium mixture to a separation zone having a static liquid pressure greater than that of the tubular saturation zone;

(e) recovering a water stream from the separation zone and recirculating the recovered water stream to the tubular saturating zone;

(f) recovering a mixed feed vapor stream of gaseous hydrocarbon fully saturated with water from the separation zone;

(g) controlling the rate of indirect heat exchange in the tubular saturation zone by selecting a controlling temperature of the mixed feed vapor stream; and

(h) introducing the mixed feed vapor stream to a steam cracking zone.

4,940,829

HYDRODEMETHYLATION OF NEOHEXANE

Charles A. Drake, Nowata, Okla., assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Oct. 18, 1988, Ser. No. 260,840
Int. Cl.[5] C07C 4/10
U.S. Cl. 585—752 18 Claims

13. A process for preparing neopentane comprising the step of contacting a feed comprising neohexane with free hydrogen and a catalsyt composition comprising (a) a support material consisting essentially of alumina, (b) palladium, (c) nickel and (d) cobalt, under such conditions as to convert at least a portion of neohexane to neopentane.

4,940,830

REJECTIVE SEPARATION OF PARA-XYLENE FROM XYLENE ISOMERS AND ETHYLBENZENE WITH ZEOLITES

Hermann A. Zinnen, Evanston, and Richard L. Fergin, Mount Prospect, both of Ill., assignors to UOP, Des Plaines, Ill.

Filed Sep. 26, 1988, Ser. No. 249,538
Int. Cl.[5] C07C 7/12
U.S. Cl. 585—828 4 Claims

1. A process for separating para-xylene from a feed mixture comprising para-xylene and at least one isomer thereof and ethylbenzene, which process comprises contacting at adsorption conditions said feed with an adsorbent comprising a sodium Y zeolite or a sodium Y zeolite which has been at least partially cation exchanged with an element selected from the group consisting of nickel and copper to effect the adsorption of said isomers and ethylbenzene in preference to para-xylene and thereafter recovering para-xylene.

4,940,831

PURIFICATION OF CIS-OLEFINS

Charles A. Drake, Nowata, Jim D. Byers; Steven D. Bridges, both of Bartlesville, all of Okla. assignor to Phillips Petroleum Company, Bartlesville, Okla.

Filed Feb. 15, 1989, Ser. No. 312,103
Int. Cl.[5] C07C 7/17
U.S. Cl. 585—836 22 Claims

1. A process for the purification of a cis-olefin formed by alkylating a sulfonate ester, wherein said cis-olefin is purified from a reaction mixture formed by the alkylation of said sulfonate ester, which process comprises the steps of:

(a) mixing said reaction mixture with an acid solution selected from the group consisting of hydrochloric acid, sulfuric acid, phosphoric acid, and acetic acid to form a first purification mixture,

(b) separating said acid solution from said first purification mixture to form a first purification product,

(c) mixing said first purification product with a C_1–C_4 alcohol to form a second purification mixture,

(d) separating said C_1–C_4 alcohol from said second purification mixture to form a final purification product, and

(e) distilling said final purification product to yield said purified cis-olefin.

4,940,832

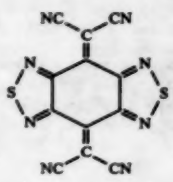
PROCESS FOR SEPARATING 2,6-DIMETHYLNAPHTHALENE

Tsutomu Miyashi, 15-18, Hitokita 3-chome, Taihaku-ku, Sendai-shi, Miyagi; Yoshiro Yamashita, Aichi; Takanori Suzuki, Miyagi, and Hiroshi Fujii, Kanagawa, all of Japan, assignors to Tsutomu Miyashi, Miyagi and Mitsubishi Oil Co., Ltd., Tokyo, both of, Japan

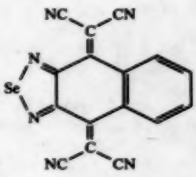
Filed Jun. 13, 1989, Ser. No. 365,635
Claims priority, application Japan, Jun. 13, 1988, 63-143772
Int. Cl.[5] C07C 7/152
U.S. Cl. 585—863 7 Claims

1. A process for separating 2,6 -dimethylnaphthalene from a 2,6-dimethylnaphthalene containing mixture which comprises mixing said 2,6-dimethylnaphthalene-containing mixture with a complexing agent selected from the group consisting of compounds A to E to thereby form a complex of the complexing agent and 2,6-dimethylnaphthalene; separating a solid matter containing the complex of the complexing agent and 2,6-dimethylnaphthalene thus formed; and decomposing said solid matter containing said complex to thereby separate and collect an oil rich in the 2,6-dimethylnaphthalene:

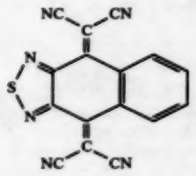
A. Bis(1,2,5)thiaziazolotetracyanoquinodimethane:



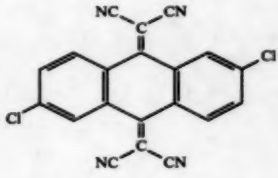
bis(1,2,5)thiazizolotetracyanoquinodimethane,



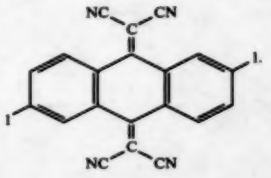
C. (1,2,5)Thiaziazolotetracyanonaphthoquinodimethane:



D. 2,6-Dichlorotetracyanoanthraquinodimethane:



E. 2,6-Diiodotetracyanoanthraquinodimethane:



4,940,833

OLEFIN MONOMER SEPARATION PROCESS

Charles A. Drake, Nowata; William R. Parrish, and Roy C. Lee, both of Bartlesville, all of Okla., assignors to Phillips Petroleum Company, Bartlesville, Okla.

Filed Nov. 29, 1988, Ser. No. 277,368
Int. Cl.[5] C07C 7/05
U.S. Cl. 585—868 25 Claims

1. A process to separate and recover olefin monomer from a substantially liquid polymerization reaction mixture comprising olefin monomer, catalyst residue, and catalyst deactivation compounds wherein said process comprises:

(a) contacting said mixture with a sufficient amount of water to form an organic phase, which comprises olefin monomer, and an aqueous phase, which comprises catalyst residue and catalyst deactivation compounds; and

(b) separating said organic phase from said aqueous phase.

4,940,834

PLANTS HAVING ENDOPHYTIO-FUNGUS-ENHANCED PERFORMANCE AND METHOD OF PRODUCING SAME

Richard H. Hurley, Flemington, and Cyril R. Funk, Jr., East Brunswick, both of N.J., assignors to Lofts, Inc., Bound Brook, N.J.

Filed Dec. 5, 1983, Ser. No. 558,338
Int. Cl.[5] A01H 5/00
U.S. Cl. 800—200 2 Claims

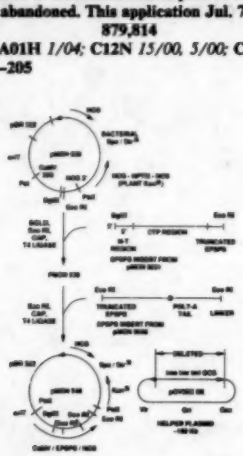
1. A perennial ryegrass designated by the varietal name Repell, characterized by its persistent, dense, attractive, low-growing turf of a bright darkgreen color; its medium seed maturity; its medium-fine leaves; its excellent wear tolerance and very good heat, cold and drought hardiness; its resistance to large brown patch disease, winter leaf spot disease and crown rust disease; its resistance to sod webworms, billbugs, and Argentine stem weevils; and its hosting of a performance-enhancing endophytic fungus of the family Clavicipitaceae or Moniliaceae.

4,940,835

GLYPHOSATE-RESISTANT PLANTS

Dilip M. Shah, Creve Coeur; Stephen G. Rogers, Chesterfield; Robert B. Horsch, and Robert T. Fraley, both St. Louis, all of Mo., assignors to Monsanto Company, St. Louis, Mo.

Continuation-in-part of Ser. No. 792,390, Oct. 29, 1985, abandoned, which is a continuation-in-part of Ser. No. 763,482, Aug. 7, 1985, abandoned. This application Jul. 7, 1986, Ser. No. 879,814
Int. Cl.[5] A01H 1/04; C12N 15/00, 5/00; C07H 15/12
U.S. Cl. 800—205 59 Claims



1. A chimeric plant gene which comprises:

(a) a promoter sequence which functions in plant cells;

(b) a coding sequence which causes the production of RNA, encoding a chloroplast transit peptide/5-enolpyruvyl-shikimate-3-phosphate synthase fusion polypeptide, which chloroplast transit peptide permits the fusion polypeptide to be imported into a chloroplast of a plant cell; and

(c) a 3′ non-translated region which encodes a polyadenylation signal which functions in plant cells to cause the addition of polyadenylate nucleotides to the 3′ end of the RNA;

the promoter being heterologous with respect to the coding sequence and adapted to cause sufficient expression of the fusion polypeptide to enhance the glyphosate resistance of a plant cell transformed with the gene.

4,940,836

SOMATIC HYBRIDS OF RUTACEAE PLANTS

Shigetaka Ishii; Toshifumi Ohgawara, both of Noda; Shozo Kobayashi, Hiroshima; Iwao Oiyama, Hiroshima, and Katsuichi Yoshinaga, Hiroshima, all of Japan, assignors to Director General of Fruit Tree Research Station Ministry of Agriculture, Forestry and Fisheries and Kikkoman Corporation, both of Japan

Filed Oct. 1, 1985, Ser. No. 782,385
Claims priority, application Japan, Feb. 20, 1985, 60-30611
Int. Cl.[5] A01H 1/04; C12N 15/00, 5/00
U.S. Cl. 800—220 11 Claims

1. Somatic hybrid plants of the Rutaceae family produced by fusing (A) first protoplasts of embryogenic cells resistant to fusion treatment and having a high proliferation activity, said first protoplasts being derived by the cultivation of undifferentiated cells obtained from subculture of cultivated cells originated from the nucellus of a first plant of the Rutaceae family with (B) second protoplasts derived from cultivated cells having no differentiation potency, said second protoplasts originated from tissue cells or tissues other than the ovules of a second plant of the Rutaceae family to form fused cells, and cultivating the fused cells in a medium containing sucrose in a concentration sufficient for the selective embryogenesis of the fused cells said first and second plants being selected from two different species.

4,940,837

STRAINS AND THEIR CULTIVATION

Yukita Kawano; Katsuhiko Kusakabe, both of Otsu; Hitoshi Maruyama, Shiga; Susumu Matsui, Otsu; Tsutomu Taniguchi, Kyoto, and Akira Obayashi, Uji, all of Japan, assignors to Takara Shuzo Co., Ltd., Kyoto, Japan

Filed Oct. 7, 1987, Ser. No. 105,342
Claims priority, application Japan, Oct. 9, 1986, 61-239058; Nov. 13, 1986, 61-268656
Int. Cl.[5] A01G 1/04
U.S. Cl. 800—200 7 Claims

1. *Lyophyllum ulmarium* characterized by a cap which is not concave when the fruiting body has matured.

4,940,838

PROCESS FOR THE INCORPORATION OF FOREIGN DNA INTO THE GENOME OF DICOTYLEDONOUS PLANTS

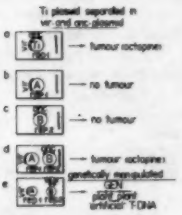
Robbert A. Schilperoort, Anthonie Duyckiaan 10c, 2334, CD Leiden; Andreas Hoekema, Boerhaavelaan 114, 2334, ET Leiden, and Paul J. J. Hooykaas, Condorstraat 126, 2317, AW Leiden, all of Netherlands

Filed Feb. 23, 1984, Ser. No. 583,022

Claims priority, application Netherlands, Feb. 24, 1983, 8300698

Int. Cl.[5] C12N *15/00, 1/20, 1/00;* C12P *19/34*

U.S. Cl. 800—205 13 Claims



1. A process for the incorporation of foreign DNA into chromosomes of dicotyledonous plants, comprising infecting the plants or incubating plant protoplasts with Agrobacterium bacteria, which contain plasmids, said Agrobacterium bacteria containing at least one plasmid having the vir-region of a Ti plasmid but no T-region, and at least one other plasmid having a T-region with incorporated therein foreign DNA but no vir-region.

4,940,839

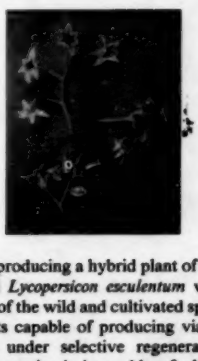
METHOD OF TOMATO PROTOPLAST FUSION AND REGENERATION OF HYBRID PLANTS THEREFROM

Janis E. Bravo, and David A. Evans, both of Palmyra, N.J., assignors to DNA Plant Technology Corporation, Cinnaminson, N.J.

Filed Oct. 1, 1986, Ser. No. 914,130

Int. Cl.[5] A01H *1/04;* C12N *15/00, 5/00, 5/02*

U.S. Cl. 800—220 14 Claims



1. A method of producing a hybrid plant of a wild species of Lycopersicon and *Lycopersicon esculentum* which comprises fusing protoplasts of the wild and cultivated species and recovering hybrid plants capable of producing viable pollen from fused protoplasts under selective regeneration conditions, wherein the wild species is incapable of plant regeneration under said conditions.

4,940,840

CHITINASE-PRODUCING BACTERIA AND PLANTS

Trevor V. Suslow, Kensington, and Jonathan D. G. Jones, Berkeley, both of Calif., assignors to DNA Plant Technology Corporation, Mt. Kisco, N.Y.

Continuation-in-part of Ser. No. 593,691, Mar. 26, 1984, Pat. No. 4,751,081. This application Jul. 18, 1986, Ser. No. 888,033

Int. Cl.[5] A01H *1/04;* C12N *15/00*

U.S. Cl. 800—205 12 Claims

1. A method of inhibiting chitinous fungal pathogens comprising introducing into a dicotyledonous plant a DNA sequence encoding for chitinase activity to create a transformed plant under conditions whereby the transformed plant expresses chitinase in active form.

4,940,841

AQUEOUS TWO-COMPONENT PAINTS FOR ONE-COATING OF HIGH-RESISTANT FINISHING SHEETING AND CONTINUOUS EDGING

Karl-Heinz Dickerhof, Drensteinfurt, Fed. Rep. of Germany, assignor to BASF Lacke & Farben Aktiengesellschaft, Munster, Fed. Rep. of Germany

PCT No. PCT/EP88/00117, § 371 Date Aug. 16, 1989, § 102(e) Date Aug. 16, 1989, PCT Pub. No. WO88/06176, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 18, 1988, Ser. No. 382,689

Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 3705255

Int. Cl.[5] C08L *61/00*

U.S. Cl. 524—510 20 Claims

1. An aqueous, two component paint for one-coat coating of finishing sheeting and continuous edging, which comprises: paint component (I) containing

(A) 40 to 85% by weight of an aqueous dispersion of a self-crosslinking polyacrylate resin which contains as groups capable of bringing about self-crosslinking, acid amide derivative groups having the general structural formula

$$—CO—N(R^1)—CH(R^2)—OR^3,$$

wherein

R^1=a hydrogen atom or a $—CH(R^2)—OR^3$ group,

R^2=a hydrogen atom or a $—COOOR^4$ group,

R^3=a hydrogen atom or a hydrocarbon radical of 1 to 10 carbon atoms and R^4=an alkyl radical of 1 to 5 carbon atoms;

(B) 5 to 50% by weight of a melamine resin dispersed or dissolved in an aqueous medium;

(C) 5 to 40% by weight of a urea resin dispersed or dissolved in an aqueous medium;

(D) 5 to 30% by weight of a polyol component; and

(E) 0.01 to 5% by weight and a

curing component (II) comprising water-dilutable acid, components (I) and (II) being mixed prior to application in a ratio of 0.05 to 3 parts by weight of the curing component (II) to 100 parts by weight of the paint component (I).

4,940,842

METHOD FOR PREPARING SUPERCONDUCTING OXIDE FILMS BY SEEDING FORMATION AND HEAT TREATMENT

Ludwig Schultz, Bubenreuth, and Joachim Wecker, Erlangen, both of Fed. Rep. of Germany, assignors to Siemens Aktiengesellschaft, Berlin & Munich, Fed. Rep. of Germany

Filed Jan. 26, 1989, Ser. No. 302,827

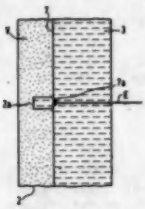
Claims priority, application Fed. Rep. of Germany, Jan. 27, 1988, 3802349; Oct. 13, 1988, 3834964

Int. Cl.[5] B05D *5/12, 3/06*

U.S. Cl. 508—1 23 Claims

1. In a method for the preparation of at least one layer of a copper oxide based superconductor with a high transition temperature, comprising applying a layer on a predetermined

substrate of a metal-oxide precursor of the components of the system with a structure still exhibiting faults with respect to a superconducting metal oxide phase to be formed and subsequently forming the desired superconducting metal-oxide phase using a heat treatment in an oxygen atmosphere, the improvement comprising forming a seed of the superconduc-



ting phase only in a locally limited region of the metal-oxide precursor at a boundary surface to the substrate by means of a solid-state reaction triggered by pulsed energy radiation, and then at least partially converting the preliminary product into the desired superconducting metal-oxide phase by heat treatment in the oxygen atmosphere at a predetermined temperature below 800° C.

4,940,843

METHOD OF PRODUCING NON-OXIDE CERAMIC SINTERED BODIES

Masakazu Adachi, Nagoya, and Kaname Fukao, Inuyama, both of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Mar. 20, 1989, Ser. No. 325,985
Claims priority, application Japan, Mar. 24, 1988, 63-68278
Int. Cl.[5] C04B 35/58
U.S. Cl. 264—65 6 Claims

1. A method of producing a non-oxide ceramic sintered body, comprising calcining a non-oxide ceramic shaped body in an atmosphere having a partial oxygen pressure of 100 ppm ~ 10000 ppm, machining the calcined body, and sintering the machined body.

4,940,844

POLYOL-ALKALI METAL SILICATE EMULSION

David H. Blunt, 6728 Del Cerro Blvd., San Diego, Calif. 92120

Continuation-in-part of Ser. No. 109,530, Oct. 19, 1987, Pat. No. 4,863,518. This application Apr. 4, 1988, Ser. No. 177,186
Int. Cl.[5] C09T 3/06; C08K 3/00; C08L 82/02, 3/00
U.S. Cl. 521—116 22 Claims

1. The process for the production of polyol-alkali metal silicate emulsion which consist of mixing the following components:

(a) aqueous alkali metal silicate solution, 1 to 50 parts by weight;

(b) a polyol, 25 to 100 parts by weight;

(c) an effective amount up to 25 parts by weight of an organic compound that will solidify the aqueous alkali metal silicate solution but not react with the alkali metal oxide and is selected from the group consisting of alcohols, polyalcohols, aldehydes, ketones, nitriles, epoxides, amines, amino compounds and mixtures thereof.

4,940,845

ESTERIFICATION PROCESS OF FATS AND OILS AND ENZYMATIC PREPARATION TO USE THEREIN

Yoshitaka Hirota; Yukitaka Tanaka, and Kouichi Urata, all of Hasakimachi, Japan, assignors to Kao Corporation, Tokyo, Japan

Filed May 17, 1985, Ser. No. 735,421
Claims priority, application Japan, May 30, 1984, 59-110333; May 30, 1984, 59-110334
Int. Cl.[5] C12P 7/64; C12N 9/20, 11/14
U.S. Cl. 435—134 11 Claims

1. A process for the interesterification of fats or oils comprising the steps of:

(1) forming a mixture of a lipase, a carrier and a lipase activator selected from the group consisting of water, a dihydric lower alcohol and a trihydric lower alcohol;

(2) adding a fat or oil to said mixture and conducting hydrolysis of said fat or oil in order to form a hydrolysis product mixture comprising said lipase immobilized on said carrier, a decomposition product of said fat or oil and unhydrolyzed fat or oil;

(3) separating said unhydrolyzed fat or oil from said hydrolysis product mixture in order to form an enzymatic preparation;

(4) forming a second mixture comprising said enzymatic preparation, a fat or oil, a compound having a fatty acid moiety to be added to said fat or oil, and a solvent and interesterifying said fat or oil; and

(5) separating an interesterified product of said fat or oil from said second mixture.

4,940,846

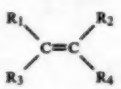
HYDROPHOBIC AND/OR ABHESIVE MATERIALS, REACTIVE DILUENTS

Rudolf Hinterwaldner, Kastanienstrasse 13, 8000 Munchen 90, Fed. Rep. of Germany

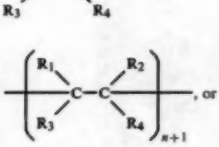
Continuation of Ser. No. 1,936, Jan. 9, 1987, abandoned, which is a continuation-in-part of Ser. No. 726,903, Apr. 18, 1985, abandoned. This application Jan. 26, 1989, Ser. No. 302,124
Claims priority, application Fed. Rep. of Germany, Aug. 18, 1983, 3329877; PCT Int'l Appl., Aug. 17, 1984, PCT/DE84/00169
Int. Cl.[5] B05D 3/02; C09K 3/00
U.S. Cl. 427—385.5 18 Claims

2. A method for rendering a substrate hydrophobic and abhesive comprising the steps of:

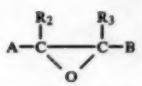
(a) applying to said substrate a curable composition comprising at least one compound of the formula



(i)



(ii)



(iii)

wherein R_1, R_2, and R_3 are each CH_3, R_4 is hydrogen, CH_3, or C_2H_5, A and B are independently hydrogen, CH_3, C_2H_5, or the formula (ii), and n is an integer between 0 to 20,000,000; and

(b) curing the composition to form a coating on the substrate.

4,940,847

METHOD FOR MANUFACTURING A FRICTION RING HAVING A CONICAL OR CYLINDRICAL FRICTION SURFACE

Johann Gramberger, Wolfsegg, Austria, assignor to ZWN Zahnradwerk Neuenstein GmbH, Neuenstein, Fed. Rep. of Germany and Miba Sinter, Laakirchen, Austria

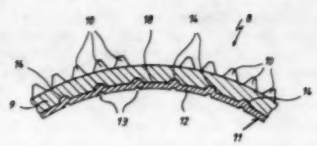
Filed Feb. 18, 1988, Ser. No. 157,646

Claims priority, application Fed. Rep. of Germany, Feb. 21, 1987, 3705660

The portion of the term of this patent subsequent to Apr. 17, 2007, has been disclaimed.

Int. Cl.[5] B32B *18/00*

U.S. Cl. 156—89 20 Claims



1. A method for manufacturing a frictional ring having a circumferential frictional surface, the method comprising the steps of:

manufacturing a ring-shaped supporting member having a first circumferential supporting surface;

moulding and compressing a sintering powder to provide a ring-shaped sinter powder member having a second circumferential supporting surface complementary to said first circumferential supporting surface;

pre-sintering said sinter powder member to provide a self-supporting mechanically stable friction member;

pressing said friction member into said supporting member with said first and second circumferential supporting surfaces adjoining each other;

sintering said friction member with said second circumferential supporting surface onto said first circumferential supporting surface of said supporting member.

4,940,848

STABLE SOLUTIONS OF PREPOLYMERS OF THIODI(PHENYLCYANATE) AND LAMINATING METHOD EMPLOYING SAME

David A. Shimp, Prospect, Ky., assignor to Hi-Tek Polymers, Inc., Jeffersontown, Ky.

Continuation-in-part of Ser. No. 45,082, May 4, 1987, abandoned. This application Nov. 10, 1988, Ser. No. 269,862

Int. Cl.[5] C09J *5/02*

U.S. Cl. 156—307.4 8 Claims

5. In a process for preparing flame retardant laminates by the steps of:

(a) impregnating fibers with a solution of a prepolymer of a polycyanate ester;

(b) heating the impregnated fibers to remove solvent and to "B" stage the prepolymer, and;

(c) heating under pressure one or more plies of the "B" staged impregnated fibers to cure the prepolymer, the improvement which comprises using a solution of a prepolymer of thiodi(phenylcyanate) in cyclopentanone solvent wherein the cyanate groups in the prepolymer are about 20 to about 65 percent trimerized and wherein about 25 to about 90 weight percent of the prepolymer is present in the total weight of the solution.

4,940,849

METALLIZING PASTE

Michael Morris, Sheffield, and John Vickers, Ulverston, both of England, assignors to Oxley Developments Company Limited, London, England

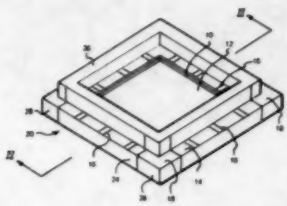
Division of Ser. No. 924,302, Oct. 23, 1986, Pat. No. 4,799,958. This application Sep. 9, 1988, Ser. No. 244,413

Claims priority, application United Kingdom, Oct. 25, 1985, 8526397

The portion of the term of this patent subsequent to Jan. 24, 2006, has been disclaimed.

Int. Cl.[5] B32B *9/00*

U.S. Cl. 428—209 7 Claims



1. A package for a semi-conductor comprising a laminated stack of sheets of alumina on which there is screen printed, firstly, a generally rectangular attachment area for receiving a semi-conductor device and, secondly, a plurality of feed-through paths for enabling external electrical communication with said semi-conductor device from the outside of said package, said rectangular attachment area and said feed through paths being screen-printed with a metallizing paste comprising the combination of:

(a) tungsten powder;

(b) frit material consisting of alumina, cerium fluoride, bismuth oxide and silica of particle size less than 45 microns; and

(c) an organic vehicle system in an amount between 20–50% by weight of the paste.

4,940,850

COLOR SORTING APPARATUS

Toshihiko Satake, Higashihiroshima, Japan, assignor to Satake Engineering Co., Ltd., Tokyo, Japan

Filed Dec. 7, 1987, Ser. No. 129,712

Claims priority, application Japan, Feb. 14, 1987, 62-31858; Feb. 16, 1987, 62-33929

Int. Cl.[5] B07C *5/342*

U.S. Cl. 209—580 12 Claims

1. A color sorting apparatus for granular objects, comprising:

a plurality of sorting units arranged in parallel relation to each other, each of said sorting units including:

(i) a detecting position,

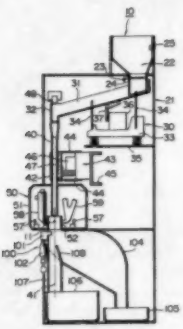
(ii) a hopper and feeding means for feeding the granular objects from the hopper toward said detecting position, the feeding means including an inclined chute having an upper end in communication with the hopper, a vertical cylindrical portion connected to and communicating with a lower end of the chute at a side wall of an upper part thereof and extending vertically downwardly below the lower end of the chute and downwardly terminating in a lower end, and a vibrator means for vibrating the chute and the cylindrical portion,

(iii) elongated tubular guide means arranged for receiving the granular objects from said lower end of the cylindrical portion of said feeding means and for guiding the granular objects therethrough, said guide means having an upper end of a diameter substantially the same as that of said lower end of the cylindrical portion and being in

alignment therewith, and a longitudinal axis extending substantially vertically, the granular objects from the cylindrical portion being moved through and guided by said guide means so as to follow a predetermined path passing through said detecting position,

(iv) light source means for illuminating the granular objects passing through said detecting position,

(v) three detectors disposed at said detecting position at angular intervals of substantially 120 degrees around said predetermined path, each of said detectors comprising background means for providing a background and light-receiving means, positioned on the opposite side of said detecting position from said background



means, for receiving light reflected by and/or transmitted through the granular objects passing through said detecting position to generate a signal,

(vi) control circuit means, connected to said light-receiving means of the respective detectors, for generating an actuating signal responsive to the signal from at least one of said light-receiving means representing undesirable granular objects, and

(vii) deflecting means located below said detecting position and operative in response to the actuating signal from said control circuit means for deflecting the undesirable granular objects out of said predetermined path, the detecting positions of the respective sorting units being spaced from each other in a horizontal plane.

4,940,851

MEMBRANE FOR USE IN X-RAY MASK AND METHOD FOR PREPARING THE SAME

Akira Oyobe, Yokohama; Toshihiko Maeda, Tokyo; Hiroyuki Nakae, Kawasaki; Toshio Hirai, 4-91, Takamori 3-chome, Izumi-shi, Miyagi, and Tsuyoshi Masumoto, 8-22, Kamisugi 3-chome, Sendai-shi, Miyagi, all of Japan, assignors to Research Development Corporation of Japan, Tokyo; Toshio Hirai, Izumi; Tsuyoshi Masumoto, Sendai and The Furukawa Electric Co., Ltd., Tokyo, all of, Japan

Filed Oct. 21, 1987, Ser. No. 111,996

Claims priority, application Japan, Oct. 31, 1986, 61-258337

Int. Cl.[5] **C03C** *03/11;* **C04B** *35/58;* **C03G** *15/08*

U.S. Cl. 501—56 **8 Claims**

8. A membrane for use in an X-ray mask, which membrane is an amorphous thin film having a thickness of from 0.5 to 10 micrometers, said film consisting of boron (B), silicon (Si) and nitrogen (N) and exhibiting B—N atomic bonding and Si—N atomic bonding, said film consisting of from 5 to 35 atomic % of B, from 15 to 35 atomic % of Si and from 50 to 60 atomic % of N, and wherein the atomic ratio

$$\frac{Si}{B + Si}$$

is from 0.2 to less than 1.0.

4,940,852

PRESSURE SENSITIVE ADHESIVE COMPOSITION

Milton Chernack, 399 June Pl., West Hempstead, N.Y. 11552, assignor to Milton P. Chernack, West Hempstead, N.Y.

Division of Ser. No. 77,007, Jul. 22, 1987, Pat. No. 4,808,639, which is a continuation of Ser. No. 886,303, Jul. 16, 1986, abandoned. This application Nov. 14, 1988, Ser. No. 270,961

Int. Cl.[5] **C08K** *9/10, 9/12*

U.S. Cl. 523—211 **6 Claims**

1. A liquid curable adhesive composition having a prolonged pot life comprising as a liquid curable resin resorcinol-formaldehyde resin; and a microencapsulated curing agent dispersed throughout said resin in an amount sufficient to cure said resin, said microcapsules being rupturable upon the application of pressure for releasing said agent and curing said adhesive composition; said resin and said curing agent being non-reactive with said microcapsules.

4,940,853

METHOD FOR GROWING TISSUE SPECIMENS IN VITRO

Herman H. Vandenburgh, 22 Chapin Rd., Barrington, R.I. 02806

Filed Jul. 22, 1988, Ser. No. 223,292

Int. Cl.[5] **C12N** *5/00;* **A01N** *1/00*

U.S. Cl. 435—240.23 **12 Claims**

1. A method of growing a tissue specimen in vitro, wherein said tissue specimen contains cells which are substantially aligned or require no alignment to simulate in vivo tissue, and said specimen is supported by an expandable support member so that it is expandable therewith comprising the steps of:

(a) maintaining said tissue specimen in a life support environment over the course of said method;

(b) providing sufficient nutrients to sustain said tissue specimen over the course of said method;

(c) maintaining the cells of said tissue specimen in an extracellular matrix sufficient to permit stretching said tissue specimen without causing damage thereto over the course of said method; and

(d) gradually and substantially continuously stretching said support member to stretch said tissue specimen by at least approximately 0.5% over the course of a 24 hr period while periodically repetitively stretching and releasing said support member to stretch and release said tissue specimen by at least approximately 0.01% for a total of at least 60 seconds during the course of said 24 hr period.

4,940,854

ORGANIC THIN FILM CONTROLLED MOLECULAR EPITAXY

Mark K. Debe, Stillwater, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 13, 1988, Ser. No. 219,004

Int. Cl.[5] **B32B** *9/04*

U.S. Cl. 428—411.1 **12 Claims**

1. A layered structure comprising in sequence:

(a) a substrate,

(b) coated on at least a portion of at least one surface of said substrate a first layer comprising a uniaxially oriented organic compound which is crystalline in three dimensions, and

(c) a second layer comprising a uniaxially oriented organic compound which is crystalline in three dimensions and which is epitaxial with said first layer, and

wherein the crystallographic b-axis of said layers is inclined on average at an angle in the range of 0 degrees to less than 90 degrees with respect to the surface normal direction of the substrate.

4,940,855

HERMETICALLY TIGHT GLASS-METAL HOUSING FOR SEMICONDUCTOR COMPONENTS AND METHOD FOR PRODUCING SAME

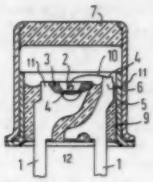
Guenther Waitl, Regensburg; Rolf Birkmann, Laaber, both of Fed. Rep. of Germany, and Ewald Schmidt, Vienna, Austria, assignors to Siemens Aktiengesellschaft, Munich, Fed. Rep. of Germany and Electrovac GES.M.B.H., Vienna, Austria

Filed Sep. 20, 1988, Ser. No. 246,983

Claims priority, application Fed. Rep. of Germany, Sep. 23, 1987, 3732075

Int. Cl.[5] H01L *23/02*

U.S. Cl. 174—52.5 11 Claims



1. Hermetically tight glass-metal housing for semiconductor components, comprising a base support for a semiconductor component in the form of a conducting strip having an upper portion and being suitable for functioning as a lead frame, a mounting pedestal disposed at said upper portion of said conducting strip, electrical contacts disposed at said upper portion of said conducting strip for electrical connections with the semiconductor component, a metal ring hermetically tightly glass sealed to but electrically isolated from said upper portion of said conducting strip, and a metal cap surrounding said metal ring, said metal ring forming a connecting element for a tight weld with said metal cap.

4,940,856

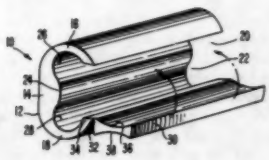
ELECTRICAL CONNECTOR

Leonard Bock, Wilton, Conn., assignor to Burndy Corporation, Norwalk, Conn.

Filed Jun. 26, 1989, Ser. No. 371,269

Int. Cl.[5] H01R *4/18*

U.S. Cl. 174—94 R 12 Claims



1. An electrical connector comprising a body member of substantially C-shaped configuration, said body member being defined by a main body portion, an upper arm, and a lower arm, said upper and lower arms each terminating in an end, an opening extending between said ends of said upper and lower arms, said opening communicating with the interior of said body member, said main body portion and said upper arm together defining an upper conductor receiving cavity, said main body portion and said lower arm together defining a lower conductor receiving cavity, each of said conductor receiving cavities being adapted to receive a conductor positioned longitudinally in said electrical connector, and at least one integral retaining member connected at one of its ends to the end of one of said ends of said arms, said retaining member being adapted to be manually rotated toward and through said opening so as to retain a conductor which is positioned in the conductor receiving cavity associated with the end of the arm to which said retaining member is secured.

11. A method of connecting a first conductor to a second conductor using an electrical connector characterized by an integral generally C-shaped body member having a main body portion and upper and lower arms, an opening extending between said upper and lower arms and communicating with the interior of said body member, said body member and said upper arm defining an upper conductor receiving cavity, said body member and said lower arm defining a lower conductor receiving cavity, a retaining member integrally and hingedly connected at one end to one of said ends of said arms, said method comprising the steps of:

(a) manually positioning a first conductor longitudinally within said conductor receiving cavity which has said end of its arm connected to said retaining member;

(b) manually rotating said retaining member toward and through said opening so that said retaining member secures said first conductor within said cavity;

(c) manually placing said connector on a second conductor so that said second conductor is longitudinally disposed with the conductor receiving cavity which does not have the end of its arm connected to the retaining member; and

(d) compressing said connector by means of a compression tool so as to bring said upper and lower arms together and closing said opening between said arms.

4,940,857

INSULATOR FOR OVERHEAD ELECTRIC WIRES

Pierre R. Giroux, 1515 Papineau Street, Trois-Rivières, Canada G8Z 4H7

Filed Aug. 15, 1989, Ser. No. 394,064

Int. Cl.[5] H01B *17/20*

U.S. Cl. 174—174 5 Claims

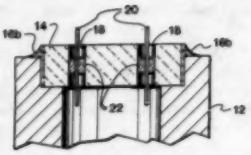
1. An electric wire insulator comprising a body made of electrically-insulating material having a top and a bottom end and forming a lower bell-shaped portion, an intermediate, annular, waist portion and a top saddle portion, said body having an axial bore opening at said bottom end for receiving an upright support pin, said top saddle portion having a transversely-curved wire-receiving groove substantially normal to said axial bore, said top saddle portion forming jutting parts on each side of said wire-receiving groove and laterally protruding from said waist portion, said jutting parts each having an external face facing away from said wire-receiving groove and provided with a partly-annular clamp-retaining groove, generally coaxial with said bore and of greater radius than the minimum radius of said waist portion, said clamp-retaining grooves adapted to positively retain the inturned flanges of a clamp having a web for overlying said wire-receiving groove and an electric wire supported therein, and downturned arms for embracing said jutting parts with said flanges extending from the lower ends of said arms.

4,940,858

IMPLANTABLE PULSE GENERATOR FEEDTHROUGH

William J. Taylor, Anoka; Douglas Weiss, Plymouth, and Joseph F. Lessar, Coon Rapids, all of Minn., assignors to Medtronic, Inc., Minneapolis, Minn.

Filed Aug. 18, 1989, Ser. No. 395,484
Int. Cl.[5] H01B *17/30*
U.S. Cl. 174—152 GM **9 Claims**



1. An improved hermetic, leak-proof, corrosion resistant electrical feedthrough, particularly adaptable to miniaturization and multi-pin construction and to IPG use, the feedthrough having substantially matched-expansion/compression joints and comprising:

at least one electrical lead wire consisting essentially of a metal or alloy selected from the group consisting of niobium, tantalum, tungsten, molybdenum and alloys thereof;

an alumina insulator positioned around a portion of the lead wire intermediate the ends thereof, the insulator including a niobium coated braze area electrically remote from the lead wire;

a ferrule consisting essentially of titanium or niobium positioned around the niobium area of the alumina insulator for receiving same in sealing relationship,

a braze consisting essentially of gold joining and sealing the ferrule to the insulator in the area of the niobium coating thereon, and

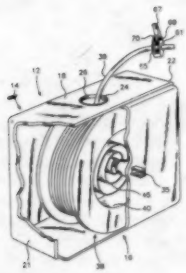
a body of fusible glass joining and sealing the lead wire to the insulator.

4,940,859

TELEPHONE CORD TAKE-UP REEL ASSEMBLY

Daniel Peterson, 152 Rivera Ct., Chula Vista, Calif. 92011

Filed Jul. 24, 1989, Ser. No. 384,162
Int. Cl.[5] H02G *11/02*
U.S. Cl. 191—12.4 **3 Claims**



1. A telephone cord take-up reel asembly comprising:

a take-up reel housing having a base member and a cover, said base member having a vertically oriented rear wall with an aperture therein, said rear wall having an inner surface, said cover having a vertically oriented front wall, a bottom wall, laterally spaced side walls and a top wall having a cutout slot laterally spaced side walls and a top wall having a cutout slot formed therein;

a take-up reel having an inner hub with laterally spaced annular flanges extending radially outwardly therefrom;

a shaft having a first end and a second end, said shaft passing through the inner hub of said take-up reel;

the front of said cover having an inner surface having a bracket moounted thereon, said bracket having an aperture that receives the first end of said shaft;

a slip ring connector having a front end, a side wall and a rear end, said front end receives and supports the second end of said shaft, said rear end is mounted on the inner surface of the rear wall of said base member;

a metal reel spring formed in the shape of a coil having an inner end and an outer end, the inner end of said spring being connected to said shaft and the outer end of said spring being connected to the inner hub of said take-up reel;

a predetermined length of telephone cord having a first end and a second end, said telephone cord being wound on said take-up reel and having its first end threaded through the cutout slot in said cover;

a male telephone adapter mounted in the aperture in the rear wall of said base member and extending outwardly therefrom; and

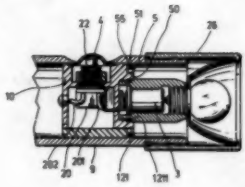
the second end of said telephone cord being connected to a female socket in the side wall of said slip ring connector.

4,940,860

WATERPROOF SWITCHING DEVICE

Shoei-Shuh Shieu, No. 10, Alley 1, Lane 551, Sec. 1, Wan-Shou Rd., Guei-Shan Hsiang, Taoyuan Hsien, Taiwan

Filed Jul. 7, 1989, Ser. No. 376,849
Int. Cl.[5] F21V *23/04*; H01H *9/04*
U.S. Cl. 200—60 **11 Claims**



1. A water resistant switching apparatus for an electric appliance having a circumferential shell defining a cavity containing electrical components to be protected from moisture, the circumferential shell having an opening allowing access to the cavity, the switching apparatus comprising:

a body having at least two parts having complementary sectioned profiles constituting sloping planes inclined longitudinally relative to an axis of the circumferential shell, the sloping planes on the two parts of the body having a conforming sloping relationship so that the two parts of the body sealingly engage each other, the body being disposed within the circumferential shell at the opening in the circumferential shell, the body including an outer peripheral wall having a circumferential dimension which is not substantially smaller than that of a space defined by an inner wall of the circumferential shell, the circumferential dimension of the outer peripheral wall of the body being adjustable by sliding one part of the body longitudinally with respect to the other part of the body, the first part of the body having a passage for allowing access to an electrical switching element;

an electrical switching element disposed in the body so that it can be actuated through the passage in the first part of the body, the electrical switching element having a mov-

able surface for actuating the electrical switching element; and

a sealing member covering the passage in the first part of the body and including an edge portion thereof which is interposed between the first part of the body and the inner wall of the circumferential shell, and covering said opening, the two parts of the body being disposed longitudinally with respect to each other so that the circumferential dimension of the outer peripheral wall of the body expands to sealingly engage the outer peripheral wall of the body with the inner wall of the circumferential shell, and to urge the first part of the body into sealing engagement with the edge portion of the sealing member, thereby compressing the sealing member between the first part of the body and the inner wall of the circumferential shell to effect a tight seal, so as to prevent an intrusion of moisture into the cavity.

4,940,861

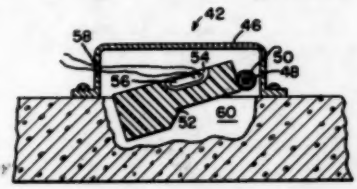
LIQUID SHUT-OFF SYSTEM

Anthony B. Rizzuto, 10 Deerfield Dr., Florham Park, N.J. 07932

Division of Ser. No. 316,661, Feb. 28, 1989. This application Nov. 30, 1989, Ser. No. 443,340

Int. Cl.[5] H01H *35/18*

U.S. Cl. 200—84 R **6 Claims**



1. A liquid shut-off system, comprising:

a solenoid valve;

said valve having means for couplingly interpositioning thereof in a liquid conduit;

a source of electrical power;

power lines electrically coupling said solenoid valve with said power source; and

means interpositioned in at least one of said power lines for inhibiting and permitting a flow of electrical power between said source and said solenoid valve; wherein

said power flow inhibiting and permitting means comprises a float switch;

said switch comprises (a) a shell, (b) a pivot pin fixed in said shell and in traverse thereof, (c) a sleeve rotatably encompassing an intermediate portion of said pin, (d) a buoyant element coupled at one end thereof to said sleeve, and (e) a liquid switch carried by said element;

said power lines are coupled to said liquid switch;

said shell has an unapertured top, and a continuous wall depending from said top; and

said wall has only (a) a pair of apertures in which said pin is fixed, and (b) a third aperture through which said power lines pass.

4,940,862

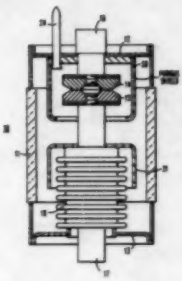
VACUUM INTERRUPTER WITH IMPROVED VAPOR SHIELD FOR GAS ADSORPTION

Vincent J. Santilli, Corning, N.Y., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 26, 1989, Ser. No. 426,826

Int. Cl.[5] H01H *33/66*

U.S. Cl. 200—144 B **11 Claims**



1. A vacuum circuit interrupter including in combination:

an evacuated envelope;

a pair of separable contacts disposed within the evacuated envelope and separable to establish arcing;

a vapor condensing shield provided interiorly within said evacuated envelope to prevent the deposition of metallic particles emitted from the arcing region onto the envelope;

said vapor condensing shield consisting essentially of highly conductive metal in a structure having a porosity of at least about 10%.

4,940,863

VACUUM INTERRUPTER CONTACTS AND PROCESS FOR PRODUCING THE SAME

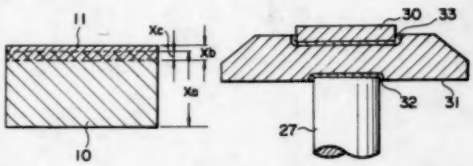
Hajime Fujita, Hachioji; Seishi Chiba, Yokohama; Tsutomu Okutomi, Yokohama; Kazuo Suzuki, Tokyo; Masami Idehara, Fuchu; Mitsutaka Houma, Tokorozawa, and Seikichi Takashima, Yokohama, all of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed May 25, 1989, Ser. No. 356,354

Claims priority, application Japan, May 27, 1988, 63-129640

Int. Cl.[5] H01H *33/66*

U.S. Cl. 200—144 B **21 Claims**



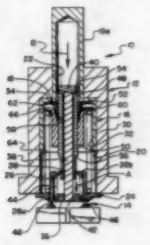
1. A vacuum breaker contact having a metal coated layer comprising at least one metal selected from the group consisting of Cu, Ag, Ni, Sn, In, Fe and alloys thereof, said metal coated layer having a thickness of 10 μm or less and being formed on at least a part of the surface of a breaker contact substrate having a predetermined shape.

4,940,864

FLOATING OPERATING AND RELEASE PAINT SWITCH ACTUATOR

Kenneth Aurand, Geneva, and James F. L. Blair, St. Charles, both of Ill., assignors to Saint Switch, Inc., St. Charles, Ill.

Filed Sep. 12, 1988, Ser. No. 243,506
Int. Cl.[5] H01H 13/14
U.S. Cl. 200—342 12 Claims



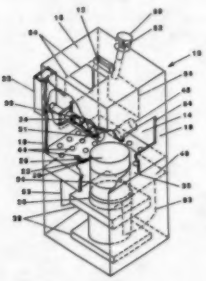
1. A switch actuator, comprising:
a base;
a plunger mounted for movement on the base;
electrical contact means mounted for movement relative to the base for establishing an electrical connection; and
actuator means mounted for movement on the base and operatively associated with the plunger for effecting movement of the electrical contact means to alter the state of the electrical connection, the actuator means including at least a pair of relatively movable members with wedge means therebetween, the wedge means being separate from the movable members and being effective to cause conjoint movement of the movable members.

4,940,865

MICROWAVE HEATING APPARATUS AND METHOD

Andrew J. Johnson, Boulder; Robert D. Petersen, Thornton, and Stephen D. Swanson, Brighton, all of Colo., assignors to The United States of America as represented by the Department of Energy, Washington, D.C.

Filed Oct. 25, 1988, Ser. No. 261,865
Int. Cl.[5] H05B 6/80
U.S. Cl. 219—10.55 A 11 Claims



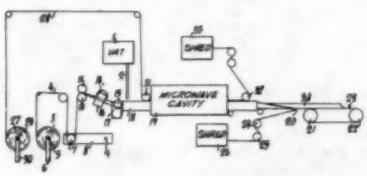
1. A microwave apparatus for heating materials, said apparatus comprising:
a microwave energy input for delivering microwave energy,
a resonant cavity for receiving microwave energy through said input, said cavity including a ceiling, walls, and a floor, said floor having a floor opening,
a microwave energy choke encompassing said floor opening of said resonant cavity,
a microwave energy reflective container for holding said materials to be heated, said container having a top portion at least as large as said floor opening of said resonant cavity, a floor portion, wall portions, and an interior, and capable of being positioned to bring said top portion level with said floor of said resonant cavity, and in substantial registration with said floor opening of said resonant cavity,
means for turning said container during exposure of said materials in said container to microwave energy, located outside of said cavity, and
means for lifting said container, located outside of said cavity,
whereby said means for turning is placed on said means for lifting, and said container is placed on said means for turning and lifted by said means for lifting to bring said top portion of said container level with said floor of said resonant cavity and in substantial registration with said floor opening of said resonant cavity, said choke encompassing said top portion of said container, and
whereby said floor portion and said wall portions of said container define a bottom floor portion and bottom wall portions of said resonant cavity and said interior of said container defines part of said resonant cavity, and
whereby said materials in said container are exposed to microwave energy, are melted, and are permitted to cool and solidify.

4,940,866

AN INSTALLATION FOR THE SHAPING OF A CONTINUOUS FOOD PRODUCT WHILE IT IS HARDENING

Francois Hauton, Villeneuve La Garenne; Frédéne Dumas, Lomme; Franck Bouttemy, Achicourt, and Christian Huc, Arras, all of France, assignors to OV'Action S.A., Lievin, France

Filed Dec. 22, 1988, Ser. No. 288,296
Claims priority, application France, Aug. 3, 1988, 8810764
Int. Cl.[5] H05B 6/78
U.S. Cl. 219—10.55 A 11 Claims



1. An installation for the shaping of a continuous food product while it is hardening as it moves from a feed zone to a demolding zone including in combination
a continuous flexible support band,
means for moving said support band,
means for guiding said moving support band along a first path portion extending in a first direction from said feed zone toward said demolding zone and along a second path portion extending in a second direction away from said demolding zone toward a discharge zone,
means for feeding the food product in the substantially liquid state to said band in said feed zone,
means for deforming the band and for keeping the band in deformed condition as it moves from the feed zone to the demolding zone,
means located between said feed zone and said demolding zone for heating said product to cause said product to harden
and means for moving hardened food product along a third

path portion extending in said first direction from said demolding zone.

4,940,867

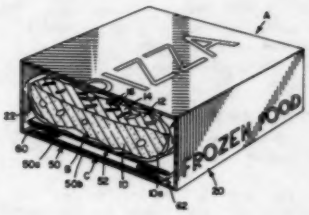
MICROWAVE COMPOSITE SHEET STOCK

Yigal Peleg, Solon, Ohio, assignor to The Stouffer Corporation, Solon, Ohio

Continuation of Ser. No. 239,600, Sep. 1, 1988, abandoned. This application Sep. 27, 1989, Ser. No. 414,647

Int. Cl.[5] H05B *6/80*

U.S. Cl. 219—10.55 E **5 Claims**



1. A disposable receptacle for heating of a food article by microwave energy, said receptacle having at least a portion thereof formed from a sheet stock which is bent and folded into a configuration having a flat suface portion therof adapted to be in contact with said food article which rests thereon, said portion having an outer peripheral shape generally at least as large as the peripheral shape of said food article, said portion comprising:

a composite, laminated sheet stock for heating, principally by conduction, the surface of a food item in contact with said flat surface portion by microwave energy,

said sheet stock including a layer of microwave opaque metal foil adhered to a microwave susceptor sheet stock, said susceptor sheet stock having a dielectric support layer of paper boerd and a heater layer of microwave interactive material in the form of vacuum deposited aluminum on a plastic sheet, said heater layer having a surface resistivity of less than 16 ohms/inch and allowing passage of microwave energy as said heater layer is heated by microwave energy, said heater layer laminated between said paper board layer and said metal foil whereby said foil is heated by conduction from said susceptor sheet stock when said susceptor stock is subjected to direct microwave radiation by the energy source and reflective microwave radiation from said foil.

4,940,868

INSULATING FOOD ITEMS WRAPPED IN METALLIC FOIL FROM A GRID IN A MICROWAVE OVEN

Sanghoon Paik, Euiwang, and Seokwon Hong, Suwon, both of Rep. of Korea, assignors to SamSung Electronics Co., Ltd., Kyung Ki-Do, Rep. of Korea

Filed Aug. 30, 1989, Ser. No. 400,821

Claims priority, application Rep. of Korea, Dec. 30, 1988, 88-22127

Int. Cl.[5] H05B *6/80*

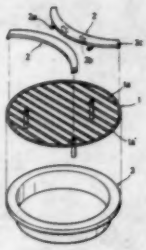
U.S. Cl. 219—10.55 E **20 Claims**

1. An insulation plate for insulating a food item wrapped in a metallic foil from a grid in a microwave oven, comprising:

a pair of elongate elements having an arcuate shape, said elements being made of an electrically insulating and elastic material; and

support means adjoining said the term elongate elements for preventing said elements from moving edgewise or to center of a grid supporting said elements, and for preventing said elements from lifting upwards from the grid;

whereby said support means engages the grid and thereby prevents the insulation plate from separating from the



grid, while the insulation plate prevents the metallic foil from causing sparking within the microwave oven.

4,940,869

COMBINATION CONVECTION AND MICROWAVE OVEN HAVING IMPROVED MICROWAVE ENERGY DISTRIBUTION

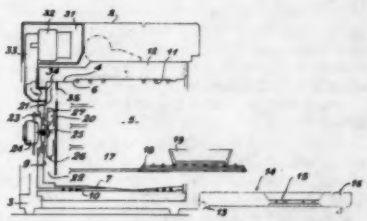
Pierre Scholtes, Thionville, and Michel Hoffmann, Cattenom, both of France, assignors to Scholtes, Thionville, France

Filed Sep. 28, 1989, Ser. No. 413,906

Claims priority, application France, Sep. 29, 1988, 88 12759

Int. Cl.[5] F05B *6/72*

U.S. Cl. 219—10.55 F **13 Claims**



1. A cooking oven having both conventional heating using rotating heat, and microwave heating, comprising:

a muffle having a front door, side walls, a lower sole plate and an upper vault, and a back wall;

a metallic distribution sheet adjacent the back wall defining a cavity with said back wall in which there is mounted a bladed turbine;

a shaft supporting said bladed turbine, passing through the back wall to be driven by an electrical motor on the opposite side of the cavity, said metallic sheet including orifices distributed so as to permit convection, forced by the turbine, of a stream of air drawn through the central part of the metallic sheet and expelled in the vicinity of its lateral sides; and,

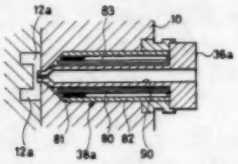
at least one source of microwave frequency waves situated outside the muffle having a waveguide output which opens into the muffle through at least one exit iris, the waveguide exit iris being situated in the back wall of the muffle facing a passage provided in the metallic distribution sheet, whereby a wave flux exiting said iris is divided into a first portion which exits said facing passage and a second portion, said second portion being distributed in the cavity behind the metallic sheet, where the turbine of the fan is situated, striking the blades of said turbine, and exiting holes pierced in the metallic sheet toward the interior of the muffle.

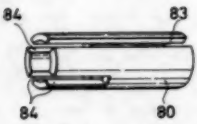
4,940,870

INDUCTION HEATING APPARATUS FOR INJECTION MOLDING MACHINE

Istuo Shibata, Hiratsuka, and Osamu Fukahori, Yokohama, both of Japan, assignors to JU-OH, Inc., Japan

Filed Feb. 22, 1989, Ser. No. 313,510
Claims priority, application Japan, Feb. 25, 1988, 63-42540
Int. Cl.[5] H05B 6/40
U.S. Cl. 219—10.491 5 Claims





1. An induction heating apparatus for using a hot runner material in an injection molding machine, the induction heating apparatus comprising:

a substantially cylindrical body wound with a coil, the substantially cylindrical body made of a metal or alloy having low magnetic permeability, a first portion of the substantially cylindrical body being in contact with a mold, the substantially cylindrical body being provided with:

(a) at least one long slot which extends along the entire length of the substantially cylindrical body; and

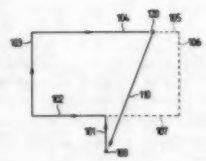
(b) at least one short slot which extends from the first portion of the substantially cylindrical body toward a middle of the substantially cylindrical body.

4,940,871

METHOD OF RESTORING A WIRE ELECTRODE BROKEN DURING AN ELECTRIC DISCHARGE MACHINING OPERATION

Naoki Watanabe, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 1, 1989, Ser. No. 317,705
Claims priority, application Japan, Mar. 1, 1988, 53-48117
Int. Cl.[5] B23H 7/06
U.S. Cl. 219—69.12 7 Claims



1. A method of restoring a wire electrode broken during an electric discharge machining operation in which a workpiece and said wire electrode are moved relative to each other with a machining voltage applied therebetween to machine said workpiece along a predetermined contour, comprising the steps of:

detecting that said wire electrode is broken during the electric discharge machining operation;

moving said workpiece to an initial machining point to restore said wire electrode broken;

setting a new wire electrode to carry out further machining operation; and

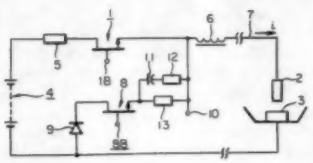
applying a machining voltage between said new wire electrode and said workpiece; moving said workpiece while electric discharges are caused between said new wire electrode and said workpiece from said initial machining point to said wire breaking point through a groove formed in said workpiece; continuing to machine the workpiece from said wire breaking point.

4,940,872

ELECTRIC DISCHARGE MACHINING CIRCUIT

Shoji Futamura, Kawasaki, Japan, assignor to Institute of Technology Precision Electrical Discharge Works, Kanagawa, Japan

Filed Jan. 13, 1988, Ser. No. 143,735
Claims priority, application Japan, Jan. 16, 1987, 62-7675
Int. Cl.[5] B23H 1/02
U.S. Cl. 219—69.13 5 Claims



1. A discharge machining apparatus having a main switching means that performs an ON-OFF operation based on a control signal and carries out discharge machining by applying voltage across an electrode and a workpiece via a power feeding path in accordance with the ON-OFF operation of said main switching means, comprising an energy dissipating circuit which dissipates the energy stored in an inductor provided in said power feeding path or an inductance component of said power feeding path by causing said stored energy to flow in the form of a current is connected in parallel with a discharge gap between said electrode and said workpiece; said energy dissipating circuit having at least one transistor switched on at or prior to the time the main switching means switches off the voltage application and said at least one transistor switching off after a predetermined period of time from the time the switching means switches off the voltage application, said predetermined period of time being shorter than the off operation time period of the switching means between voltage applications; the resistance value of an equivalent resistor provided in said energy dissipating circuit for causing an energy dissipating current being set so as to increase with time within said predetermined period of time.

4,940,873

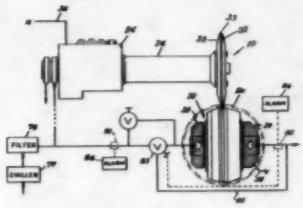
ROLLER ELECTRODES FOR ELECTRIC-RESISTANCE WELDING MACHINE

Joseph R. Davies, 220 West Haven, New Lenox, Ill. 60451

Continuation-in-part of Ser. No. 53,375, May 22, 1987, Pat. No. 4,780,589. This application Mar. 28, 1988, Ser. No. 173,764
The portion of the term of this patent subsequent to Oct. 25, 2005, has been disclaimed.
Int. Cl.[5] B23K 11/06
U.S. Cl. 219—84 38 Claims

1. In a roller electrode adapted for use in electric resistance seam welding apparatus to weld overlapped edges of a metal

blank, the roller electrode having stator and rotor components, the rotor and stator components having annular surfaces spaced apart across thin gaps, bearing means for mounting said rotor to rotate relative to said stator with movement via said gaps, and a conductive liquid simultaneously contacting said



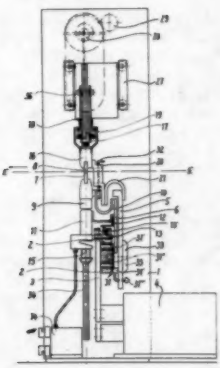
annular surfaces to electrically conduct a welding current across said gaps between the components, the improvement comprising the combination of said conductive liquid being of a composite eutectic mixture of gallium (Ga), indium (In), tin (Sn) and zinc (Zn), by weight, being substantially 61% Ga, 25% In, 13% Sn, and 1% Zn.

4,940,874

CONVERTIBLE SINGLE OR DOUBLE SPOT WELDING MACHINE

Gerhard Ritter; Klaus Ritter; Rudolf Scherr, and Kurt Jursche, all of Graz, Austria, assignors to EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H., Graz, Austria

Filed Mar. 22, 1989, Ser. No. 326,915
Claims priority, application Austria, Mar. 31, 1988, 860/88
Int. Cl.[5] B23K *11/10*
U.S. Cl. 219—87 **16 Claims**



1. An electrical resistance spot welding machine for single or double spot welding, for producing grids or bar grates, comprising

means for defining a welding plane and for advancing work material in a longitudinal direction in said plane;

rows of first and second electrodes on respective ones of first and second opposite sides of said plane, said rows extending parallel to said plane in a direction transverse to said longitudinal direction;

at least one welding transformer on said first side of said plane;

first electrically conductive removable connections from a first output terminal of said welding transformer to said first row of electrodes;

second electrically conductive removable connections, passing through said plane, from a second output terminal of said welding transformer to said second row of electrodes, and

removable current bridges sized to electrically connect selective pairs of said second electrodes,

wherein for single spot welding, opposing first and second electrodes are respectively connected to said first and second terminals of said welding transformer by said first and second electrically conductive removable connectors, and

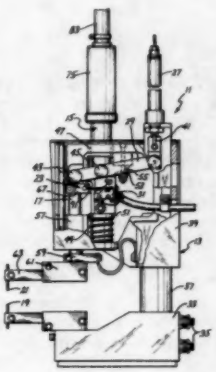
wherein for double spot welding, said selective pairs of second electrodes are electrically connected to each other by means of said current bridges, and each electrode of selective opposing pairs of said first electrodes is respectively connected to said first and second terminals of said welding transformer.

4,940,875

FORCE LIMITING WELD HEAD

William H. Hill, Pala, and Joseph E. Donner, Vista, both of Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Feb. 22, 1989, Ser. No. 313,932
Int. Cl.[5] B23K *11/30*
U.S. Cl. 219—89 **10 Claims**



1. In a welding apparatus including a supporting structure, a movable member and an output member mounted for movement on the supporting structure, a first electrode mounted on the supporting structure, a movable electrode driven by the output member, coupling means for drivingly coupling the output member to the movable member to move the movable electrode toward the fixed electrode whereby a workpiece can be contacted by the electrodes and can arrest movement of the output member and for allowing the movable member to move relative to the output member to overtravel after movement of the output member is arrested by the workpiece, means for driving the movable member to thereby drive the output member and the movable electrode, and means responsive to relative movement between the movable member and the output member for energizing the electrodes, the improvement comprising:

said coupling means including means defining a variable-volume chamber, a fluid medium in said chamber and means responsive to the overtravel for varying the volume of the chamber.

4,940,876

METHOD OF FLASH-BUTT RESISTANCE WELDING OF A BATCH OF LIKE PARTS IN PAIRS

Sergei I. Kuchuk-Yatsenko, ulitsa P.Osipenko, 17, kv. 18.; Mikhail V. Bogorsky, ulitsa Ozernaya, 30, kv. 120.; Daniil I. Belyaev, ulitsa Cheshskaya, 4, kv. 141.; Andrei V. Bondaruk, bulvar Koltsova, 17-G, kv. 26., and Nikolai D. Goronkov, ulitsa Chelyabinskaya, 11, kv. 38., all of Kiev, U.S.S.R.

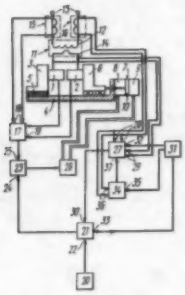
PCT No. PCT/SU87/00178, § 371 Date May 15, 1989, § 102(e) Date May 15, 1989, PCT Pub. No. WO89/02333, PCT Pub. Date Mar. 23, 1989

PCT Filed Sep. 9, 1988, Ser. No. 368,306

Claims priority, application U.S.S.R., Sep. 15, 1987, 4305525

Int. Cl.[5] B23K *11/04*

U.S. Cl. 219—110 1 Claim



1. A method of flash-butt resistance welding of a batch of like workpieces in pairs comprising the steps of placing a pair of workpieces (1,2) into a welding machine to form a welding circuit, settig an appropriate value of short-circuit impedance of the welding circuit for a first pair of workpieces (1,2) connecting the welding circuit to a power supply, and flashing off said pair of workpieces, while continuously monitoring the resistance between welded workpieces (1,2) during flashing of the first and subsequent pairs of welded workpieces (1,2), comparing the actual resistance between welded workpieces (1,2) for the first pair of welded workpieces (1,2) with the initially set short-circuit impedance of the welding circuit, and, in order to maintain the resistance between the wielded workpieces (1,2) on a desired level, drawing together or moving apart the first pair of welded workpieces (1,2) as a function of the resultig resistance obtained through the comparison of the actual resistance between the welded workpieces (1,2) with the initially set short-circuit impedance of the welding circuit, and, finally, upsetting the workpieces (1,2) being welded together, characterized by that the method additionally comprises the steps of monitoring the welding current during upsetting process of each pair of workpieces and, when the welding current reaches a constant level, determining a more exact short-circuit impedance of the welding circuit through the use of said current and voltage measured simultaneously with said welding current, and comparing, during welding of each sunsequent pair of workpieces (1,2), the actual resistance between workpieces (1,2) with the short-circuit impedance of the welding circuit, which had been specified during the flashing off of each preceding pair of workpieces (1,2), and drawing together and moving apart said workpieces (1,2) during flashing off of each pair of such workers (1,2) as a function of the resulting resistance obtained through the comparison of the actual resistance between the workpieces (1,2) being welded and the short-circuit impedance of the welding circuit, which is specified during the weldinrg of each preceeding pair of workpieces (1,2).

4,940,877

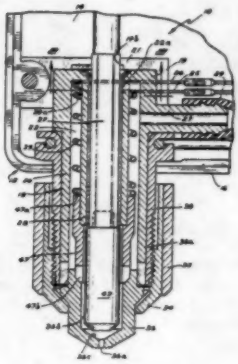
PARTS IN PLACE TORCH STRUCTURE

Daniel M. Broberg, Edina, Minn., assignor to Century Mfg. Co., Minnesota

Filed Sep. 15, 1989, Ser. No. 407,873

Int. Cl.[5] B23K *9/00*

U.S. Cl. 219—121.5 9 Claims



1. A plasma torch, comprising

a torch housing,

a pair of electrical contacts in said housing in different planes, said contacts being included in an operating circuit,

an electrode supported in said housing,

a nozzle in operative association with the lower portion of said electrode,

nozzle supported means forming an upward extension thereof,

resilient means, disposed between said last mentioned means and said contacts, being of such a length as to require being urged by said last mentioned means to the extent of becoming deformed to engage both of said contacts,

whereby in the absence of said nozzle supported means or said nozzle, said resilient means does not engage said contacts, thus making said torch inoperative.

4,940,878

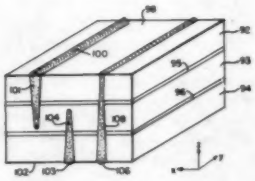
ANISOTROPIC RESISTIVITY MATERIAL AND METHOD OF MAKING SAME

Bobby D. McKee, San Jose, and Alvin H. Nakagawa, Campbell, both of Calif., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Dec. 15, 1988, Ser. No. 284,881

Int. Cl.[5] B23K *26/00*

U.S. Cl. 219—121.64 4 Claims



1. An anisotropic resistivity body made by the process of:

(A) providing a base member, of a first metal, and having first and second surfaces;

(B) placing a second metal on a first surface of said base

member, said second metal having a different composition than said first metal;

(C) making multiple passes over said surface with a high energy beam so as to cause, on each said pass, an alloyed zone to penetrate said base member from said first toward said second surface; and

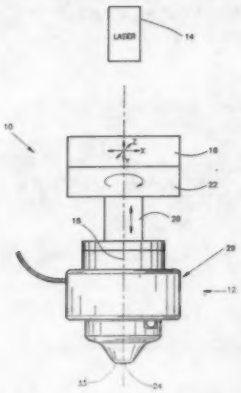
(D) removing an excess metal, including all of said second metal, on the surfaces of said base member so as to form a body having alternate zones of different resistivity.

4,940,879

CUTTING HEAD FOR USE IN A NON-CONTACT CUTTING PROCESS

Avner De-Swaan, Ramat Hasharon, Israel, assignor to F.I.A. Futurologie Industrielle Automation GmbH, Frankfurt am Main, Fed. Rep. of Germany

Filed Oct. 11, 1989, Ser. No. 419,816
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.67 **23 Claims**



1. A cutting head for use in a non-contact process of cutting a work piece that is attractable by a magnetic force, said cutting head comprising:

a cutting tip;

means for sensing proximity of a work piece to said cutting tip; and

electably operable magnetic means for attracting a slug formed from the work piece, said magnetic means being arranged within said cutting head so as not to interfere with the operation of said means for sensing.

4,940,880

COMBINATION PUNCH PRESS AND LASER CUTTING MACHINE WITH LASER BEAM GENERATOR MOUNTED THEREON

Hans Klingel, Moeglingen, and Juergen Doettling, Ditzingen, both of Fed. Rep. of Germany, assignors to Trumpf GmbH & Co., Ditzingen, Fed. Rep. of Germany

Filed Sep. 11, 1989, Ser. No. 405,476
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.67 **33 Claims**

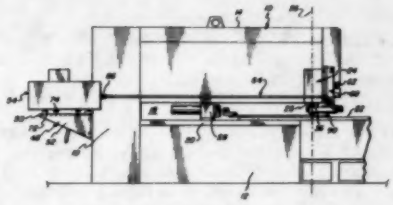
1. A combination punch press and laser cutting machine comprising:

(a) a substantially rigid frame of generally C-shaped configuration with an elongated base, an elongated head extending in spaced relationship thereabove, and a vertically extending neck therebetween at the rearward end of the frame, said neck defining the vertical height of the open throat between the head and base, said frame having a platform extending rearwardly from said neck and providing a horizontal surface at said neck;

(b) a ram assembly in said head adjacent its forward end for reciprocation of a ram relative to said base to punch workpieces disposed on said base, the axis of reciprocation defining the workstation;

(c) a laser cutting assembly mounted on said forward end of said head including a cutting head having a nozzle at its lower end, a lens for focusing the laser beam exiting said nozzle, and a mirror spaced above said nozzle for directing the laser beam through said nozzle;

(d) a laser beam generator on said platform and having an exit aperture adjacent one side of said neck;



(e) vibration isolating means disposed between said platform and said laser beam generator; and

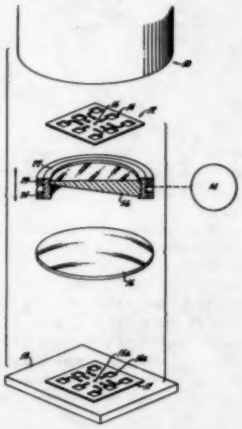
(f) a laser beam transport assembly including an elongated enclosure extending forwardly from said laser beam generator exit aperture along the side of said frame to said forward end of said head and including at the forward end thereof a beam redirection assembly having a series of mirrors effecting a redirection of the laser beam, in both vertical and horizontal directions and in two different planes, to said mirror of said cutting head.

4,940,881

METHOD AND APPARATUS FOR EFFECTING SELECTIVE ABLATION OF A COATING FROM A SUBSTRATE, AND CONTROLLING THE WALL ANGLE OF COATING EDGE PORTIONS

Ronald E. Sheets, Santa Ana, Calif., assignor to Tamarack Scientific Co., Inc., Anaheim, Calif.

Filed Sep. 28, 1989, Ser. No. 413,778
Int. Cl.[5] B23K *26/00*
U.S. Cl. 219—121.69 **26 Claims**



1. A method of controlling the wall angle of an edge region of a substance being ablated by pulses from an excimer laser, said method comprising:

(a) providing an excimer laser system including an excimer laser, a mask, a projection lens, and a workpiece to be ablated, and

(b) substantially continuously displacing the beam from said laser, at a region between said mask and said workpiece, in such manner that the displaced beam strikes said workpiece and progressively ablates portions thereof corresponding to the shape of openings in said mask, and in such manner that the wall angle at the edge of an ablated region of said workpiece is determined by said displacement.

4,940,882

WELDING FLUX AND WELDING ELECTRODE

Thomas O. Bates, Huntington, W. Va., assignor to Inco Alloys International, Inc., Huntington, W. Va.

Filed Apr. 27, 1989, Ser. No. 343,630

Int. Cl.[5] B23K *35/22*

U.S. Cl. 219—146.22 **15 Claims**

7. A welding electrode having a core wire containing about 25 to 35% nickel, up to about 1.5% iron, up to about 0.12% carbon, up to 3% manganese, up to about 1% titanium, up to about 1% silicon, up to about 0.75% aluminum, up to about 0.03% boron, up to about 1% cobalt and the balance copper and impurities, the core wire having a flux coating consisting essentially of about 5 to about 35% calcium carbonate, about 20 to about 40% cryolite, about 10 to about 30% titanium dioxide, about 1 to about 5% aluminum powder, about 2 to about 8% manganese powder, about 2 to about 8% calcium fluoride, up to about 8% lithium carbonate about 2 to about 7% bentonite, about 1 to about 5% of an arc agent containing 73–77% TiO_2, 19–21% K_2O and about 1% ZrO_2 and about 5 to about 12% nepheline syenite.

4,940,883

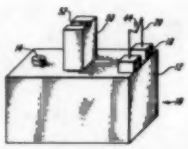
WINDOW BURNER FOR POLYMER COATED CAPILLARY COLUMNS

Barry L. Karger, Newton, and Robert J. Nelson, Boston, both of Mass., assignors to Northeastern University, Boston, Mass.

Filed Apr. 24, 1989, Ser. No. 342,989

Int. Cl.[5] H05B *3/02*

U.S. Cl. 219—200 **16 Claims**



1. A window burner for creating a window of uniform dimension in a polymer coated capillary column by selective removal of a predetermined portion of the polymer coating thereof, comprising:

circuit means for generating a predetermined, controlled current for a predetermined period of time; and

resistive wire means electrically coupled to said circuit means and configured for mounting of the polymer coated capillary column for selectively burning off the predetermined portion of the polymer coating of the mounted capillary column to create the window of uniform dimension therein, said resistive wire means having a predetermined gauge to provide the uniformity of dimension among windows created by said window burner; and wherein

said predetermined, controlled current flows through said resistive wire means of said predetermined gauge for said predetermined period of time to heat said resistive wire means to a predetermined temperature to selectively burn off the predetermined portion of the polymer coating of the mounted capillary column; and further wherein

said predetermined gauge of said wire resistive means and said predetermined, controlled current flowing for said predetermined period of time in combination define the predetermined portion of the polymer coating selectively burned off of the mounted capillary column wherein said window burner reproducibly creates windows of uniform dimension.

4,940,884

DUAL BUS BAR ARRANGEMENT FOR AN ELECTRICALLY HEATABLE TRANSPARENCY

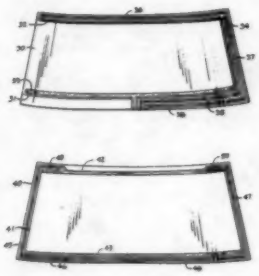
Frank H. Gillery, Hampton Township, Allegheny County, Pa., assignor to PPG Industries, Inc., Pittsburgh, Pa.

Continuation-in-part of Ser. No. 138,008, Dec. 28, 1987, Pat. No. 4,820,902. This application Dec. 19, 1988, Ser. No. 286,016

The portion of the term of this patent subsequent to Apr. 11, 2006, has been disclaimed.

Int. Cl.[5] H05B *3/84, 3/26;* E06B *7/12;* B60J *1/20*

U.S. Cl. 219—203 **17 Claims**



1. An electrically heated transparency comprising: a transparent sheet, a transparent electroconductive coating on a major surface of the sheet, a first bus bar in contact with the coating along a first edge portion of the sheet, a second bus bar in contact with the coating along a second edge portion of the sheet opposite the first edge portion, at least two electroconductive extensions extending from the second bus bar to at least one terminal area at an edge region removed from the second edge portion, the extensions being electrically insulated from the coating.

4,940,885

HEATING APPARATUS INCLUDING ULTRA-VIOLET PORTION

Wendall R. Challenger, 1838 Princess Dr., Longmont, Colo. 80501

Continuation-in-part of Ser. No. 96,535, Sep. 15, 1987. This application Jul. 1, 1988, Ser. No. 214,661

Int. Cl.[5] H05B *1/00, 3/02;* F24H *7/00*

U.S. Cl. 219—365 **25 Claims**

1. A heating system using heat transfer fluid, comprising:

means for storing heat transfer fluid, when such fluid is present in such a system;

primary means for heating heat transfer fluid to a preselected temperature, said primary heating means being associated with said heat transfer fluid storing means;

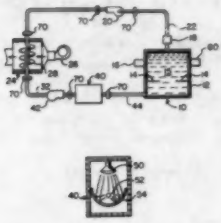
means for utilizing heated heat transfer fluid;

means for transporting heated heat transfer fluid from said heat transfer fluid storing means to said heat utilizing means, whereby, heat energy from heated heat transfer fluid when such fluid is present in such system is trans-

ferred to an area external to the heating system, and, as a result of which the heat transfer fluid is cooled;

means for transporting cooled heat transfer fluid, when present, from said heat utilizing means back to said heat transfer storage means;

secondary means for heating fluid, when present, after such fluid is cooled at said heat utilizing means and prior to the return of such cooled fluid to said storage means, said



secondary heating means being located intermediate said heat utilizing means and said heat transfer storage means and in fluid series with said means for transporting cooled heat transfer fluid from said heat utilizing means back to said heat transfer storage means; whereby such fluid, when present and cooled at said heat utilizing means, is preheated before it is returned to said heat transfer fluid storing means.

4,940,886

ELECTRIC HOTPLATE

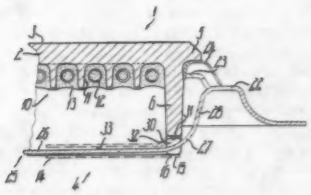
Robert Kicherer, and Felix Schreder, both of Oberderdingen, Fed. Rep. of Germany, assignors to E.G.O. Elektro-Gerate Blanc u. Fischer, Fed. Rep. of Germany

Filed Mar. 29, 1989, Ser. No. 293,960

Claims priority, application Fed. Rep. of Germany, Apr. 20, 1988, 8805230[U]

Int. Cl.[5] H05B *3/70*

U.S. Cl. 219—457 **21 Claims**



4. An electric hotplate comprising:

a hotplate body providing a cooking surface and an underside remote from said cooking surface, said underside defining different height extensions of said hotplate body, the hotplate body providing a radially outer region;

at least one engagement member for a holding element for securing the hotplate with respect to a cooker plate, wherein said hotplate body has a lower height extension in at least a part of said radially outer region than in a region radially inside of said radially outer region, said hotplate body being provided on said underside with at least one reception depression for a substantially surface-flush reception of at least part of the holding element.

4,940,887

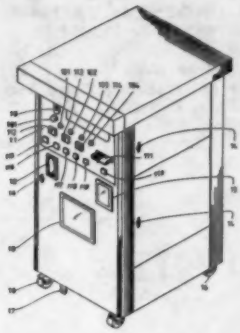
AUTOMATIC MAIL HANDLING AND POSTAGE VENDING MACHINE

Wu Sheng-Jung, 389, Sec. 5, Nanking East Rd., Taipei

Filed Oct. 20, 1986, Ser. No. 920,648

Int. Cl.[5] G06F *15/21, 15/30*

U.S. Cl. 235—381 **17 Claims**



1. An automatic mail item handling device comprising a housing and a microcomputer controller, said housing having an inlet for a mail item;

a mail item weighing means for determining the weight of the mail item located adjacent to the inlet and operatively connected to the microcomputer controller;

a first conveying means for conveying a mail item from the inlet to the weighing means, said conveying means being located adjacent to the weighing means and being operatively connected to the microcomputer;

a return means operable by a user for causing return of the mail item to the user said return means comprising a button operatively connected to the microcomputer;

a selecting means to enable a user to select a desired mail classification, said selecting means being operatively connected to said microcomputer;

a calculating means for calculating appropriate postage due for the mail item in dependence upon weight and mail classification thereof, said calculating means being contained within said microcomputer;

an indicating means for indicating to the user the weight of and postage due for the mail item, said indicating means being mounted on said housing;

a payment receiving means for receiving a payment taken from a user the payment receiving means being mounted on the housing and operatively connected to a verifying means;

the verifying means for verifying said payment token against the postage due for the mail item, said verifying means being operatively connected to said microcomputer;

a postage marking means for marking the mail item, the the postage marking means being operatively connected to said microcomputer;

a second conveying means for conveying the mail item from said weighing means to said postage marking means, said second conveying means being located adjacent to said postage marking means and being operatively connected to said microcomputer;

a sorting means for sorting mail items in accordance with said mail classification, said sorting means being connected to the postage marking means, said sorting means being operatively connected to said microcomputer;

wherein said first conveying means comprises means for automatically adjusting for mail item thickness and wherein the mail item weighing means comprises a roller mounted on a swing plate disposed above an electronic weigher, a linkage being attached to the swing plate for

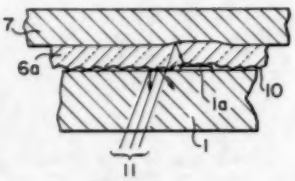
moving the swing plate from a first position to a second position, the first position for receiving a mail item, the second position for weighing a mail item, the linkage being activated by a solenoid driven by the microprocessor.

4,940,888

DIRECT-CONTACT-TYPE IMAGE SENSOR AND IMAGE SENSOR ASSEMBLY

Tatsuya Nagata, Ibaraki; Takehiko Yamada; Eiichi Hara, both of Chigasaki, and Michihiro Watanabe, Tsuchiura, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Mar. 10, 1989, Ser. No. 321,881
Claims priority, application Japan, Mar. 14, 1988, 63-58310
Int. Cl.[5] H01L *27/14;* H01J *40/14*
U.S. Cl. 250—208.1 21 Claims



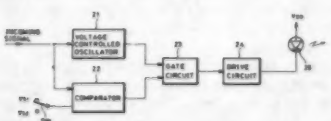
1. A direct-contact-type image sensor comprising; a plurality of sensor elements; a sensor element mounting substrate, having a surface on which the plurality of sensor elements are mounted and which is light-transmissive at least in the vicinity of portions of the sensor element mounting substrate where said sensor elements are mounted; and an electroconductive transparent film disposed on a surface of said substrate which is adjacent said sensor elements, having a surface facing the sensor elements, the film being disposed in such a manner as to cover the plurality of said sensor elements, said surface of said film facing the sensor elements being formed with fine irregularities at least over said sensor elements and at portions in the vicinity of said sensor elements.

4,940,889

METHOD AND APPARATUS FOR VISUAL INDICATION OF OPTICAL ALIGNMENT OF PHOTOELECTRIC SWITCH

Shoichi Ono, 12-8, Takashima 1-chome, Suwa-shi, Nagano-ken, and Atsuhito Kobayashi, 6-2, Honmachi 1-chome, Okaya-shi, Nagano-ken, both of Japan

Filed Aug. 15, 1989, Ser. No. 394,130
Int. Cl.[5] H01J *40/14*
U.S. Cl. 250—214 R 8 Claims



1. An alignment system for aligning an optical axis of a light beam with a light receiving element, comprising:

means for producing a light reception signal having an amplitude related to an amount of light received by said light receiving element;

a light;

means for flashing said light at a frequency related to said amplitude;

means for halting said flashing when said amplitude exceeds a reference voltage; and

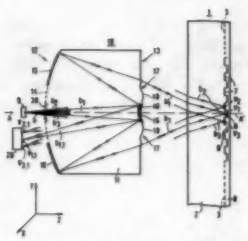
said reference voltage being a value that is exceeded by said amplitude when alignment of said optical axis with said light receiving element is substantially optimum.

4,940,890

OPTICAL SCANNING DEVICE, MIRROR OBJECTIVE SUITABLE FOR USE IN SAID DEVICE AND OPTICAL WRITE AND/OR READ APPARATUS PROVIDED WITH SAID DEVICE

Willem G. Opheij, and Josephus J. M. Braat, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 326,587, Mar. 21, 1989, abandoned.
This application Dec. 5, 1989, Ser. No. 449,294
Claims priority, application Netherlands, Dec. 13, 1988, 8803055
Int. Cl.[5] H01J *3/14*
U.S. Cl. 250—216 15 Claims



1. A scanning device for optically scanning an object, which device comprises a radiation source supplying a scanning beam, a mirror objective for focusing the scanning beam to a scanning spot and a radiation-sensitive detection system for receiving radiation from the object to be scanned, characterized in that the mirror objective comprises a radiation-transparent body having a first surface facing the radiation source and a second surface remote from the radiation source, said first surface having a first radiation window which is located symmetrically around the optical axis of the mirror objective and having a first reflector surrounding said window, said second surface having a second reflector which is located symmetrically around the optical axis and a second radiation window surrounding said second reflector, in that the first radiation window supports a first diffraction element for forming a scanning beam and two auxiliary beams from the radiation beam supplied by the radiation source and in that the second reflector supports a second diffraction element for diffracting a part of radiation reflected by the object to be scanned and again passing through the mirror objective towards the radiation-sensitive detection system and for deforming the diffracted scanning beam in such a way that a focus-error signal can be derived therefrom by means of the detection system.

4,940,891

AUTOMATED SYSTEM FOR MEASURING THE STRENGTH OF OPTICAL FIBERS

Howard E. Rast, Solana Beach, Calif., assignor to The United States of America as represented by the Secretary of the Navy, Washington, D.C.

Filed Aug. 22, 1989, Ser. No. 397,074
Int. Cl.[5] H01J *5/16*
U.S. Cl. 250—227.15 8 Claims

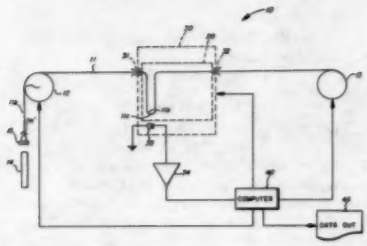
1. An apparatus for rapidly and automatically measuring the

strength distribution in an optical fiber having a core for transmitting light comprising:

means optically coupled to said optical fiber for projecting light longitudinally into said core;

means disposed adjacent said optical fiber for sensing light emanating from breaks in portions of said core;

means disposed to receive said optical fiber therein for initiating said breaks in said fiber;



means connected to said optical fiber for feeding said portions of said optical fiber through the initiating means; and

means operatively connected to the light sensing means, the initiating means and the feeding means for actuating the automatic feeding of said portions by said feeding means and the initiating of said breaks in said optical fiber by said initiating means in response to the sensing of said light emanating from each of said breaks in said fiber.

4,940,892

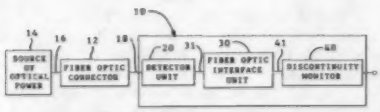
OPTICAL DISCONTINUITY MONITOR SYSTEM

David W. Fisher, Schuylkill Haven, and Eric T. Frishkorn, Harrisburg, both of Pa., assignors to AMP Incorporated, Harrisburg, Pa.

Filed Apr. 5, 1989, Ser. No. 333,513

Int. Cl.[5] H01J *5/16*

U.S. Cl. 250—227.24 **9 Claims**



1. A system for monitoring optical power transmitted through a fiber optic connector subjected to environmental stress comprising:

converting means for converting fluctuations in the optical power transmitted through said connector into a fluctuating electronic signal,

comparison means for determining when said electronic signal exceeds a high voltage limit or falls below a low voltage limit and for producing output signals indicative of the time periods for which said electronic signal exceeds said high voltage limit or falls below said low voltage limit, and

duration measuring means responsive to said output signals for determining if said electronic signal exceeds said high voltage limit or falls below said low voltage limit for a time period having a duration in excess of a predetermined duration.

4,940,893

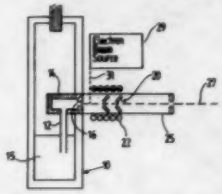
METHOD AND APPARATUS FOR FORMING COHERENT CLUSTERS

Shui-Yin Lo, Sherman Oaks, Calif., assignor to Apricot S.A., Luxembourg, Luxembourg

Filed Mar. 18, 1988, Ser. No. 169,648

Int. Cl.[5] H05H *3/00*

U.S. Cl. 250—251 **24 Claims**



1. A method for forming coherent clusters by expansion comprising: generating clusters and causing at least some of the clusters to become coherent by manipulating temperature and pressure conditions; exposing said clusters prior to about the time of creation of said clusters by expansion, to particles which cause said clusters to become charged, said exposing being done in a manner that does not destroy said clusters nor the coherence of said clusters.

4,940,894

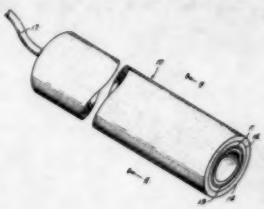
ELECTRODE FOR A CORONA DISCHARGE APPARATUS

Ronald W. Morters, Waukesha, Wis., assignor to Enercon Industries Corporation, Menomonee Falls, Wis.

Continuation-in-part of Ser. No. 131,118, Dec. 10, 1987, abandoned. This application Jan. 12, 1989, Ser. No. 296,457

Int. Cl.[5] H01T *14/00*

U.S. Cl. 250—324 **22 Claims**



1. In an electrode for a high frequency high voltage corona treater, the electrode having a conductive core and a dielectric covering, the improvement which comprises the core being a tube of conductive material and the dielectric covering comprising an intermediate dielectric layer and an outer dielectric layer; said intermediate dielectric layer being bonded to the core in a continuous substantially voidless manner; and said outer dielectric layer being comprised of particles of high dielectric material bound together and to the intermediate dielectric layer by a dielectric adhesive.

4,940,895

IMAGING APPARATUS

Daniel I. Mansfield, Leicester, United Kingdom, assignor to Rank Taylor Hobson, United Kingdom

Filed Aug. 15, 1988, Ser. No. 232,607

Claims priority, application United Kingdom, Aug. 26, 1987, 8720104

Int. Cl.[5] G02B *26/10*

U.S. Cl. 250—332 **17 Claims**

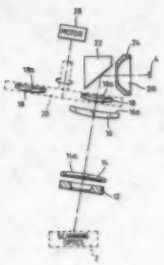
1. Thermal imaging apparatus comprising:

an array of parallel thermal detectors, which detectors ex-

hibit a range of different responsivities, which range is significantly diverse at wavelengths greater than a predetermined long wavelength;

optical means for directing thermal energy radiation to said array of parallel detectors;

inhibiting means effective to inhibit passage to said detector



array of radiation of at least a range of wavelengths greater than said predetermined long wavelength; and

electronic means operable to apply differing preset gain to each signal derived from a respective one of said parallel detectors, which preset gain differs according to the different detector responsivities thereof, and compensates at least partly for said different detector responsivities.

4,940,896

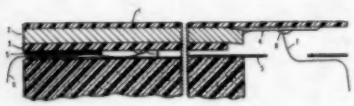
PYROELECTRIC CALORIMETER

William A. Hagins, Chevy Chase, and Shuko Yoshikami, Bethesda, both of Md., assignors to The United States of America as represented by the Department of Health and Human Services, Washington, D.C.

Filed Feb. 2, 1989, Ser. No. 305,331

Int. Cl.[5] G01J *1/00*

U.S. Cl. 250—338.3 **8 Claims**



1. A pyroelectric detector comprising a support member having a tapered through-hole therein, a first polyester film positioned on said support member, across said through-hole, an aluminum foil member located on an opposite side of said polyester film from said support member, a pyroelectric film located on an opposite side of said aluminum foil member from said first polyester film, at least one additional polyester film located on an opposite side of said pyroelectric film from said aluminum foil member, and two pyroelectrical leads connected to opposite sides of said pyroelectric film.

4,940,897

NOVEL PYROELECTRIC DETECTOR

Martin Forster, Jona, and Claudia Illert, Stafa, both of Switzerland, assignors to Cerberus AG, Switzerland

Filed Jun. 1, 1989, Ser. No. 359,971

Claims priority, application Switzerland, Jun. 1, 1988, 2067/88

Int. Cl.[5] G01J *1/00*; B23K *31/02*

U.S. Cl. 250—338.3 **20 Claims**

1. A pyroelectric detector comprising a substrate, pyroelectric material distributed in a binder and applied to said substrate, and at least two electrically conductive electrodes, wherein the pyroelectric material comprises lithium tantalate consisting of single crystal particles, said lithium tantalate

containing an amount of tantalum ranging from 25 to 75 mole % as tantalum pentoxide.

4,940,898

SEMICONDUCTING METAL SILICIDE RADIATION DETECTORS

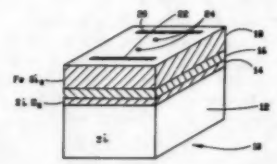
John E. Mahan, Fort Collins, Colo., assignor to Colorado State University Research Foundation, Fort Collins, Colo.

Continuation-in-part of Ser. No. 913,354, Sep. 30, 1986, Pat. No. 4,782,377. This application May 2, 1988, Ser. No. 189,310

The portion of the term of this patent subsequent to Nov. 1, 2005, has been disclaimed.

Int. Cl.[5] H01L *31/02*

U.S. Cl. 250—338.4 **30 Claims**



1. A method of detecting infrared radiation equal to or less than 14 microns in wavelength comprising the steps of:

electrically connecting a conductivity detector to a body of semiconducting $ReSi_2$;

exposing said body of semiconducting $ReSi_2$ to said infrared radiation;

detecting a change in the conductivity of said body of semiconducting $ReSi_2$ in response to said infrared radiation.

4,940,899

TRANSPORT AND STORAGE FLASK

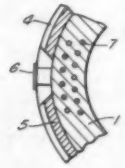
John Emmison, Warrington, and Anthony R. Cory, Knutsford, both of England, assignors to British Nuclear Fuels plc, Warrington, England

Filed Nov. 21, 1988, Ser. No. 273,565

Claims priority, application United Kingdom, Dec. 18, 1987, 8729504

Int. Cl.[5] G21F *5/00*

U.S. Cl. 250—506.1 **4 Claims**



1. A flask for the transport and storage of radioactive material comprising a hollow body, lifting trunnions on the body and external neutron shielding about the body except in the

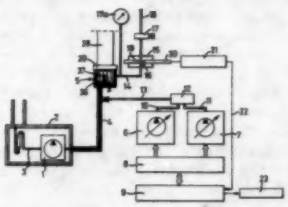
regions of the trunnions, and in which further neutron shielding is provided in blind bores in the wall of the body at each end of the body, the blind bores extending beneath the trunnions to compensate for lack of external shielding at the trunnions and being of sufficient number and length only to extend beneath and slightly overlap the external shielding adjacent the region of each trunnion.

4,940,900

METHOD AND APPARATUS FOR DETERMINING THE FLOCCULATION THRESHOLD OF A PETROLEUM PRODUCT

Didier C. Lambert, Lavera, France, assignor to BP Oil International Limited, London, England

Filed Aug. 17, 1988, Ser. No. 233,196
Claims priority, application France, Aug. 18, 1987, 87 11687
Int. Cl.[5] G01N *21/59*
U.S. Cl. 250—343 **13 Claims**



1. A method for determining the flocculation threshold of a petroleum product containing asphaltenes by measuring the near infrared radiation transmitted through a sample of the product in solution in a solvent in relation to the quantity of precipitant continuously added to the sample, characterized in that:

a blend of solvent and precipitant is continuously formed at variable concentrations;

the blend and the petroleum product are fed in constant proportions into a homogenizing chamber; and

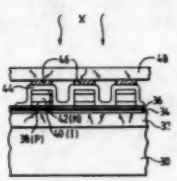
the near infrared radiation transmitted through the homogeneous product is measured continuously downstream of the homogenizing chamber.

4,940,901

X-RAY IMAGING DEVICE

Yves Henry, Eybens, and Marc Arques, Grenoble, both of France, assignors to Thomson-CSF, Paris, France

Filed Nov. 7, 1988, Ser. No. 268,262
Claims priority, application France, Nov. 10, 1987, 87 15534
Int. Cl.[5] H01L *27/12*; G01T *1/208*
U.S. Cl. 250—370.09 **8 Claims**



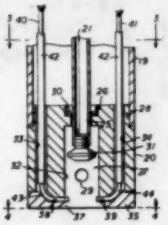
1. A device for the conversion of images into electrical signals comprising, firstly, a matrix arrangement of photosensitive elements formed on an insulating substrate and, secondly, a scintillating substance, wherein said scintillating substance is interposed between said substrate and the matrix of photosensitive elements, said matrix being formed as a non-self-supporting superposition of patterned layers deposited on the substrate and wherein an insulating planarization layer is interposed between the scintillating substance and the deposited layers of the matrix.

4,940,902

APPARATUS AND METHOD FOR CONTINUOUS MEASUREMENT OF SUSPENDED SOLIDS IN A LIQUID MEDIUM WITH WIPING MEANS

Emmanuel Mechalas, 2830 Townway, Danville, Ill. 61832, and Laverne E. Foran, 240 S. Park Rd., La Grange, Ill. 60525

Filed Oct. 24, 1988, Ser. No. 261,754
Int. Cl.[5] G01N *15/06*
U.S. Cl. 250—573 **13 Claims**



1. A method of continuously sampling and measuring the concentration of suspended solids in a liquid medium comprising the steps of

providing a submersible sample chamber which is apertured to allow liquid to flow freely therethrough and has at least one light emitting lens in the liquid flow path connected by a fiber optic bundle to a non-submerged light source and at least one light receiving lens in the liquid flow path aligned with the emitting lens and connected by a fiber optic bundle to a non-submerged light detector with no electrical connection in the submersible portion,

submitting the apertured sample chamber in the liquid medium to be sampled and measured to allow continuous fluid communication between the interior and exterior of the sample chamber through the liquid flow path and between the light emitting and light receiving lenses therein, and

transmitting light from the non-submerged light source to the emitting lens, through the liquid between the lenses to the light receiving lens, and from the receiving lens to the non-submerged light detector for determining the concentration and/or density of suspended solids in the sample liquid,

providing a movable lens wiper in the sample chamber configured to contact the lens members sufficiently to wipe them clean of debris upon movement therebetween while allowing clearance between the sample chamber wall and in its stationary position allowing an unrestricted light and fluid flow path in the sample chamber, and

moving the lens wiper between the lens members at selective continuous or intermittent cycles.

4,940,903

MOTOR CONTROLLED SWITCH MECHANISM

Robert J. Brown, Jr., Boca Raton, Fla., and Bahattin Erturk, Rollingmeadows, Ill., assignors to Square D Company, Palatine, Ill.

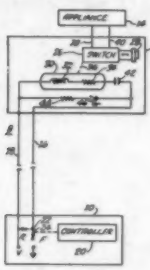
Filed Jan. 23, 1989, Ser. No. 299,775
Int. Cl.[5] H01H *47/00*
U.S. Cl. 307—122 **12 Claims**

1. A motorized switch for use in a system in which a central

controller provides signals to control the state of said switch, said switch comprising:

motor means for rotating a shaft in one of a clockwise or a counterclockwise rotational direction in response to said controller signals;

switch means for rendering a pair of contacts in one of an open circuit condition or a short circuit condition, said switch means including a rotating pin having an offset extending therefrom, said pin, being normally connected with said shaft and being rotated so that said offset travels along an arc between a first position when said contacts are open and a second position when said contacts are closed; and



connector means having a open center into which said offset extends, one end of said connector means being affixed to said shaft, said open center having a pair of inner edges extending radially from said shaft, said motor means rotating said connector means so that said inner edges of said connector move said offset between said first position and said second position, said inner edges extending for a distance to permit relative radial movement of said offset against said inner edges of said connector during movement of one of said inner edges against said offset toe effect a change of states of said switch means.

4,940,904

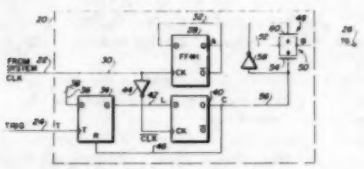
OUTPUT CIRCUIT FOR PRODUCING POSITIVE AND NEGATIVE PULSES AT A SINGLE OUTPUT TERMINAL

Cheng F. Lin, Hsing Chu Hsien, Taiwan, assignor to Industrial Technology Research Institute, Taiwan

Filed May 23, 1988, Ser. No. 197,628

Int. Cl.[5] H03K *5/00, 5/13, 3/29, 19/00*

U.S. Cl. 307—262 **2 Claims**



1. A circuit for providing both a positive-going and a negative-going pulse output at a single output terminal in response to the receipt of a single trigger input pulse, said circuit comprising in combination:

a. a clock input terminal for receiving a synchronizing clock signal that periodically switches between a first clock logic level and a second clock logic level, said synchronizing clock signal having a predetermined frequency;

b. a divide-by-2 circuit having an input coupled to said clock input terminal for receiving said synchronizing clock signal and having an output providing a divided clock signal, the divided clock signal having a frequency of one-half that of the synchronizing clock signal, the output of said divide-by-2 circuit alternating between high and low logic levels upon each transition of the synchronizing clock signal from the second clock logic level to the first clock logic level;

c. a transmission gate having a data input coupled to the output of said divide-by-2 circuit for receiving the divided clock signal, said transmission gate having an output terminal for providing both a positive-going and a negative-going pulse output, said transmission gate including a control terminal for receiving a control signal, said transmission gate being responsive to said control signal for electrically coupling the divided clock signal to the output terminal of said transmission gate when the control signal is in a first enabled state, and being responsive to said control signal for causing the output terminal of said transmission gate to assume a high impedance state when the control signal is in a second disabled state;

d. a trigger input terminal for receiving a trigger pulse; and

e. control circuit means coupled to said trigger input terminal and to said clock input terminal for receiving the trigger pulse and the synchronizing clock signal, respectively, said control circuit means being coupled to the control terminal of said transmission gate for providing the control signal thereto, said control circuit means initially causing the control signal to assume the second disabled sate prior to receipt of a trigger pulse, said control circuit means causing the control signal to switch to its first enabled state after detecting a first transition of the synchronizing clock signal from the first clock logic level to the second clock logic level after receipt of the trigger pulse, and said control circuit means causing the control signal to again switch to its second disabled state after detecting a second transition of the synchronizing clock signal from the first clock logic level to the second clock logic level following receipt of the trigger pulse, said control circuit means including:

(i) latch means having an input coupled to said trigger input terminal for receiving the trigger pulse, having a latch output, and having a reset terminal for receiving a reset signal, said latch means causing the latch output thereof to assume a first logic state upon receipt of the trigger pulse and causing the latch output to assume a second logic state upon receiving the reset signal at the reset terminal thereof; and

(ii) flip-flop means having a data input terminal, a clock terminal, and a control output terminal, the data input terminal of said flip-flop means being coupled to the latch output, the clock terminal of said flip-flop means being responsive to the synchronizing clock signal for causing the control output terminal of said flip-flop means to assume an output state in accordance with the state of the data input terminal upon each transition of the synchronizing clock signal from the first clock logic level to the second clock logic level, the control output terminal of said flip-flop means being coupled to said reset terminal of said latch means and to the control terminal of said transmission gate for supplying the control signal thereto.

4,940,905

ECL FLIP-FLOP WITH IMPROVED X-RAY RESISTANT PROPERTIES

Tohru Kobayashi, Iruma; Masato Hamamoto, Ohme, and Toshio Yamada, Kokubunji, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 256,863, Oct. 12, 1988, Pat. No. 4,891,531. This application Oct. 24, 1989, Ser. No. 426,047

Claims priority, application Japan, Oct. 20, 1987, 62-264541

Int. Cl.[5] H03K *3/013, 3/037, 3/287, 19/086*

U.S. Cl. 307—278 **20 Claims**

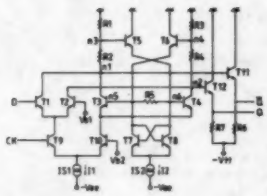
1. A semiconductor integrated circuit device including a flip-flop circuit, said flip-flop circuit comprising:

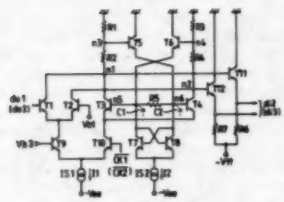
a first differential bipolar transistor;

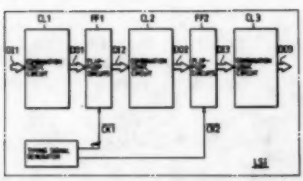
a second differential bipolar transistor coupled to said first differential bipolar transistor to form differential switching means;

input means coupled to said first differential bipolar transistor for supplying the collector of said first differential bipolar transistor with a potential in accordance with input data; and

feedback means coupled to said first and second differential bipolar transistors and including resistor means coupled in series between the respective bases of said first and second differential bipolar transistors, first bias means for supplying the base of said second differential bipolar transistor







with a potential in accordance with a potential at the collector of said first differential bipolar transistor, second bias means for supplying the base of said first differential bipolar transistor with a potential in accordance with a potential at the collector of said second differential bipolar transistor, and first switching means coupled to the bases of said first and second differential bipolar transistors and to a predetermined potential point and for selectively coupling the base of either said first or second differential bipolar transistor to said predetermined potential point in accordance with a potential at the collector of each of said first and second differential bipolar transistors.

4,940,906

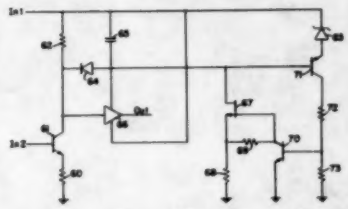
POWER SWITCH DRIVER

Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Filed Aug. 8, 1988, Ser. No. 229,914

Int. Cl.[5] H03K *3/01, 3/26*

U.S. Cl. 307—296.1 **19 Claims**



11. Driver for converting input signal into binary output signal, comprising:

an isolating means having an input and output for receiving the input signal and providing a signal in response thereto respectively, wherein an impedance between the input and output is substantially high;

a current source means for providing a current;

a capacitive means for receiving the current and storing a supply voltage, and including a means for limiting the supply voltage; and

a buffer means for receiving the supply voltage and providing the binary output signal in response to the isolating means signal.

4,940,907

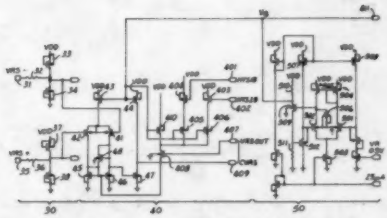
PRECISION CMOS COMPARATOR WITH HYSTERESIS

David P. Laude, Colorado Springs, Colo., assignor to Ford Motor Company, Dearborn, Mich.

Filed Jan. 19, 1989, Ser. No. 299,188

Int. Cl.[5] H03K *5/24*

U.S. Cl. 307—359 **21 Claims**



1. A differential CMOS comparator having an output, said comparator including:

a programmable hysteresis circuit having a differential pair of MOS transistors and a current mirror pair of transistors coupled to said differential pair of transistors; and

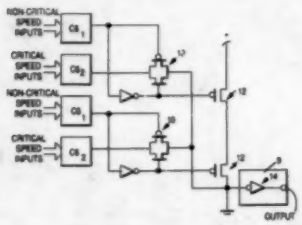
a comparator voltage reference having an output and being coupled to said programmable hysteresis circuit for providing a reference voltage which is a function of a MOSFET threshold voltage.

4,940,908

METHOD AND APPARATUS FOR REDUCING CRITICAL SPEED PATH DELAYS

Thang M. Tran, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnydale, Calif.

Filed Apr. 27, 1989, Ser. No. 343,623
Int. Cl.[5] H03K *19/01*
U.S. Cl. 307—443 **6 Claims**



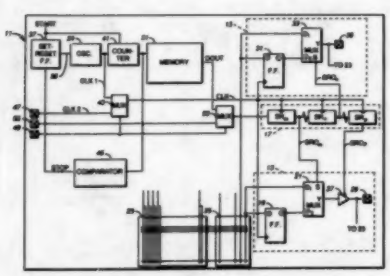
1. A logic circuit comprising a plurality of mutually exclusive non-critical speed inputs coupled to at least one first logic gate structure having a first gate output, at least one critical speed input coupled to at least one second logic gate structure having a second gate output, at least one multiplexer coupler responsive to said first gate output to selectively couple said second gate output to an output interface of said logic circuit.

4,940,909

CONFIGURATION CONTROL CIRCUIT FOR PROGRAMMABLE LOGIC DEVICES

Theodor Mulder, Pleasanton, and Cecil H. Kaplinsky, Palo Alto, both of Calif., assignors to Plus Logic, Inc., San Jose, Calif.

Filed May 12, 1989, Ser. No. 351,485
Int. Cl.[5] H03K *19/177*
U.S. Cl. 307—465 **17 Claims**



1. In an integrated circuit device having selectable architecture configurations, a configuration control circuit comprising,

a programmable memory on the integrated circuit device having an addressable array of nonvolatile memory cells for storing configuration bits,

one or more shift registers in data communication with said programmable memory, said shift registers being loadable with said configuration bits, and

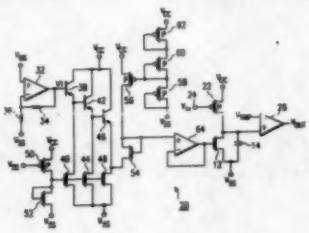
control means responsive to configuration bits loaded into said shift registers for causing said integrated circuit device to operate in a selected architecture configuration corresponding to said configuration bits.

4,940,910

TEMPERATURE COMPENSATED MONOLITHIC DELAY CIRCUIT

Ching-Lin Jiang, Dallas, Tex., assignor to Dallas Semiconductor Corporation, Dallas, Tex.

Continuation of Ser. No. 217,142, Jun. 30, 1988, Pat. No. 4,843,265. This application Jun. 2, 1989, Ser. No. 360,511
The portion of the term of this patent subsequent to Jun. 27, 2006, has been disclaimed.
Int. Cl.[5] G05F *1/567*
U.S. Cl. 307—591 **21 Claims**



1. A timing circuit, comprising:

a capacitor;

a first field-effect transistor, comprising a gate, connected to discharge said capacitor;

an additional stage, connected to said capacitor and configured to change state when said capacitor is discharged to a predetermined voltage;

a plurality of bipolar transistors, connected to reduce a temperature-independent reference voltage by a multiple of the base-emitter voltage drop of one of said plurality of bipolar transistors, to provide a temperature-dependent reference potential;

a second field-effect transistor, having source and drain terminals con between a first current source and said temperature-dependent reference potential having a gate connected to said drain terminal thereof;

said gate of said first field-effect transistor being coupled to said gate of said second field-effect transistor so that said gate of said first field-effect transistor receives a voltage corresponding to the voltage on said gate of said second field-effect transistor.

4,940,911

SUBMERSIBLE PUMP EQUALIZER WITH MULTIPLE EXPANDING CHAMBERS

Brown L. Wilson, Tulsa, Okla., assignor to Oil Dynamics, Inc., Tulsa, Okla.

Filed Jun. 21, 1989, Ser. No. 370,238
Int. Cl.[5] H02K *5/132*; F04B *19/00*
U.S. Cl. 310—87 **3 Claims**

1. A protective device for insertion between a submersible electric motor in a well bore and a pump located above and driven by the motor, said motor filled with a fluid, said device comprising:

an upper header and a lower header;

a hollow housing extending between said upper and lower headers and fixed thereto;

a tube concentrically mounted within said hollow housing and extending between said upper and lower headers;

a first expandable bag-like membrane having a first end and a second end, said first end sealed to said upper header and said lower end sealed to said lower header, said first membrane surrounding said tube;

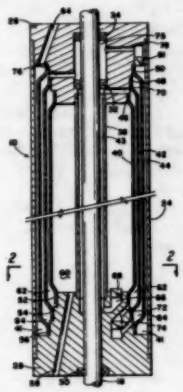
a second expandable bag-like membrane having a first end and a second end and surrounding said first bag member, said first end and said second end respectively sealed to said upper header and said lower header;

a third expandable bag-like membrane having a first end and a second end and surrounding said second bag, said first end and said second end sealed respectively to said upper header and said lower header;

there being formed a first chamber between said first bag and said hollow tube, a second chamber between said first and second bags; a third chamber between said second and third bag, a fourth chamber between said third bag and said housing and a fifth chamber within said tube;

a first passage through said lower header from the exterior to the first chamber;

a second passage through said lower header and a check valve therein, said second passage extending from said first chamber to the interior of said hollow tube;



a third passage which extends through a portion of said upper header from the fifth chamber to said second bag;

a fourth passage in the lower header and a check valve therein, said passage extending from said second chamber to said third chamber;

a fifth passage through said upper header extending from said third chamber to the space between said third bag and the interior of said housing and a check valve in said fifth passage; and

a fifth passage without check valve through said upper header from said fourth chamber to the exterior of the device.

4,940,912

BRUSHLESS ELECTRIC MOTOR WITH SELF STARTING ASYMMETRY

Michel Kant, Villiers sur Coudun; Jean-Marie Biedinger, Chiry Ourscamps; Roland Quessard, Romorantin, and Jacques Galko, La Chappele sur Loire, all of France, assignors to Societe de Ventilation et d'Electricite Appliquees - Velecta, Romorantin and Gradient, Compiege Cedex, both of, France

Filed Jun. 2, 1989, Ser. No. 360,976

Claims priority, application France, Jun. 3, 1988, 88 07436

Int. Cl.[5] H02K *29/10, 3/16*

U.S. Cl. 310—162 **13 Claims**

1. An electric motor with electronic commutation, including:

a rotor (2) which includes permanent magnets (12, 13) disposed in such a manner as to define a magnetic rotor axis;

and a stator (3) that surrounds the rotor and includes coils (5, 6, 7, 8) intended to be supplied with direct current, and defining a magnetic stator axis (A),

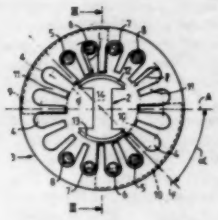
commutation means (C) being provided for reversing the direction of the flow of current in the coils, so that the electromagnetic torque exerted by the stator (3) on the rotor (2) always acts in the same direction,

means (D) sensitive to the position of the rotor being provided for controlling the commutation means (c) and for reversing the direction of flow of the current in the coils,

reluctance pads (9, 10) being further provided in the stator (3) for placing the rotor (2) upon stopping in a position in which the startup of the motor will be assured, wherein

said stator (3) includes an even number of notches (4) separated by teeth (11) spaced at regular intervals over the entire inside periphery of the stator (3),

said reluctance pads (9, 10) are asymmetrical with respect to the magnetic stator axis (A) and are formed of two diametrically opposed groups of teeth and notches, the teeth not belonging to the reluctance pads having a length (1) less than the length (L) of the teeth belonging to the reluctance pads,



said coils (5, 6, 7, 8) of the stator are accommodated in part (5, 6) in the notches of the reluctance pads (9, 10) and the remainder in the notches not belonging to the reluctance pads, such that said stator coils (5, 6, 7, 8) are placed in the vicinity of the diametral plane orthogonal to the magnetic axis (A) of the stator, so as to improve the winding coefficient, said axis of the reluctance pads being offset by 45° with respect to the magnetic axis (A) of the coils of the stator, each reluctance pad having an angular length of approximately 100°.

4,940,913

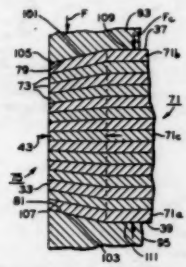
CORE FOR A DYNAMOELECTRIC MACHINE

Harold L. Fritzsche, Rapid City, S. Dak., assignor to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 220,800, Jul. 18, 1988, which is a division of Ser. No. 934,889, Nov. 25, 1986, Pat. No. 4,794,778, which is a continuation-in-part of Ser. No. 904,140, Sep. 4, 1986, Pat. No. 4,796,451, which is a division of Ser. No. 660,211, Oct. 12, 1984, Pat. No. 4,613,780. This application Mar. 17, 1989, Ser. No. 325,211

Int. Cl.[5] H02K *1/00*

U.S. Cl. 310—216 **26 Claims**



1. An edgewise wound core comprising:

a lanced strip of generally thin ferromagnetic material hav-

ing a pair of generally opposite edges and edgewise wound into a plurality of helical convolutions arranged in a generally annular stack thereof, respectively;

a leading helical convolution and a trailing helical convolution on said stack defining a pair of opposite end faces thereof, respectively;

an inner circumferential surface and an outer circumferential surface on said stack extending generally axially between said opposite end faces thereof and defined at least in part by said opposite edges on said helical convolutions in said stack, respectively;

a yoke on said helical convolutions and extending generally circumferentially about said stack between said opposite end faces thereof, said yoke including a tapered part on each of said helical convolutions at least generally adjacent one of said opposite edges thereof and having a thickness less than that of the helical convolutions between said tapered part and the other of said opposite edges on said helical convolutions, and said tapered part on axially adjacent ones of said helical convolutions in said stack being engaged with each other thereby to comprise said outer circumferential surface of said stack, respectively;

a generally annular beveled surface on at least one of said opposite end faces of said stack at least generally adjacent said outer circumferential surface thereof, said beveled surface comprising said tapered part on at least one of said leading and trailing helical convolutions in said stack;

a plurality of teeth on said helical convolutions extending on preselected pitch axes therefor generally radially inwardly from said yoke and arranged in a plurality of tooth rows extending generally axially between said opposite end faces of said stack, said teeth including a plurality of tips at least generally adjacent said other opposite edge on said helical convolutions and arranged in a plurality of tooth tip rows generally axially between said opposite end faces of said stack thereby to comprise said inner circumferential surface of said stack, respectively; and

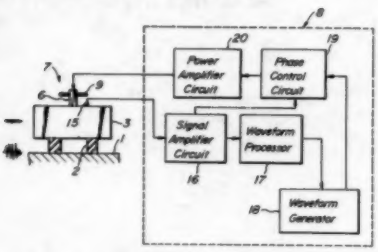
a plurality of winding receiving slots in said helical convolutions between said yoke and adjacent ones of said teeth thereof and intersecting with said other opposite edge on said helical convolutions between said tooth tips, said slots being arranged in a plurality of slot rows extending generally axially of said stack and intersecting with said opposite end faces and said inner circumferential surface between said tooth tip rows, respectively.

4,940,914

VIBRATION ABSORBING APPARATUS

Keiichiro Mizuno, Tokyo, and Kazuyoshi Iida, Yokohama, both of Japan, assignors to Bridgestone Corporation, Tokyo, Japan

Filed May 16, 1988, Ser. No. 194,371
Claims priority, application Japan, May 26, 1986, 62-129474
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—326 **6 Claims**



1. A vibration absorbing apparatus for absorbing vibrations of a vibration damping objective, comprising:

a support member attached to said vibration damping objective and having a plurality of notches formed therein;

a plurality of vibration members fitted in said notches of said support member, said vibration members being of different lengths;

a plurality of piezo-ceramic elements each attached to a base of a respective one of said vibration members;

detecting means for detecting movement of said vibration damping objective; and

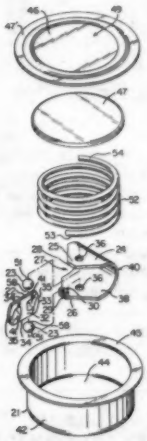
voltage applying means, responsive to said detecting means, for applying a voltage to the piezo-ceramic elements in accordance with the vibration state of the objective so as to induce vibrations in said vibration members and reduce an amplitude of vibrations of the objective.

4,940,915

OSCILLATING CRYSTAL FORCE TRANSDUCER AND METHOD OF MAKING

Douglas R. Scott; Peggy L. Goddard, and Joseph P. Wagner, all of Knoxville, Tenn., assignors to Robertshaw Controls Company, Richmond, Va.

Division of Ser. No. 167,847, Mar. 14, 1988, Pat. No. 4,799,301.
This application Nov. 2, 1988, Ser. No. 266,405
Int. Cl.[5] H01L *41/08*
U.S. Cl. 310—338 **17 Claims**

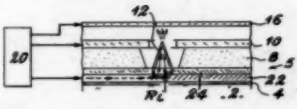


1. In an oscillating crystal force transducer comprising support means, a substantially flat plate-shaped piezo-electric crystal having opposed flat sides and a relatively narrow peripheral edge means extending between said opposed sides, and two seating members carried by said support means and respectively engaging said peripheral edge means of said crystal and arranged to apply a force to said crystal along a line extending through said crystal from one of said seating members to the other of said seating members, the improvement wherein said support means comprises a looped substantially flat ribbon-like spring member having a longitudinal axis disposed in a generally U-shape and having opposed free end means spaced from each other to define the mouth of said looped spring member and respectively carrying said seating members whereby said crystal is disposed in said mouth of said looped spring member between said seating members thereof in a manner to be substantially coplanar with said longitudinal axis of said spring member.

4,940,916
ELECTRON SOURCE WITH MICROPOINT EMISSIVE CATHODES AND DISPLAY MEANS BY CATHODOLUMINESCENCE EXCITED BY FIELD EMISSION USING SAID SOURCE

Michel Borel, Le Touvet; Jean-Francois Boronat, Grenoble; Robert Meyer, St Nazaire les Eymes, and Philippe Rambaud, Claix, all of France, assignors to Commissariat a l'Energie Atomique, France

Filed Nov. 3, 1988, Ser. No. 266,681
Claims priority, application France, Nov. 6, 1987, 8715432
Int. Cl.[5] H01J *1/30, 1/90, 29/04*
U.S. Cl. 313—306 **8 Claims**

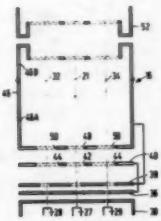


1. Electron source comprising first parallel electrodes (5) serving as cathode conductors, each cathode conductor having an electrically conductive layer (22), whereof one face carries a plurality of micropoints (12) made from an electron emitting material and second parallel electrodes (10) serving as grids and which are electrically insulated from the cathode conductors (5) and form an angle therewith, which defines intersection zones of the cathode conductors and grids, the micropoints (12) being located at least in said intersection zones, the grids (10) also being positioned facing said faces and have holes (14) respectively facing the micropoints, the apex of each micropoint being substantially level with the hole corresponding thereto, the micropoints of each intersection zone being able to emit electrons when the corresponding grid is positively polarized with respect to the corresponding cathode conductor, an electrical current then flowing in each micropoint of the zone, characterized in that each cathode conductor (5) also has means for limiting the intensity of the electrical current flowing in each micropoint of said cathode conductor, said means having a continuous resistive layer (24,25) located on the conductive layer (22) of the corresponding cathode conductor (5), between said conductive layer and the corresponding micropoints (12), said corresponding micropoints resting on the resistive layer (24,25).

4,940,917
COLOR CATHODE RAY TUBE HAVING AN IN-LINE ELECTRON GUN

Lambert J. Stil, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Jul. 25, 1988, Ser. No. 224,086
Claims priority, application United Kingdom, Jul. 29, 1987, 8717984
Int. Cl.[5] H01J *29/50*
U.S. Cl. 313—414 **8 Claims**



1. A color cathode ray tube including an envelope containing a luminescent screen and an electron gun for producing three in-line electron beams directed toward said screen, said electron gun comprising:

a. a triode section for forming the electron beams, said triode section including, in order:

(1) central and first and second outer cathodes disposed on respective central and first and second outer in-line axes for emitting electrons along said axes;

(2) first and second adjacent electrodes, each having central and first and second outer apertures symmetrically disposed about the respective axes, for forming the emitted electrons into the electron beams;

b. prefocusing electrode means having central and first and second outer apertures disposed about the respective axes, said first and second outer apertures being eccentrically disposed about the respective axes to effect convergence of the electron beams proximate the screen;

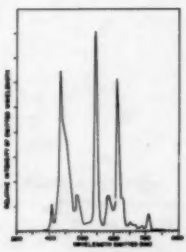
c. error correcting electrode means including an electrode having central and first and second outer apertures disposed about the respective axes, said first and second outer apertures being eccentrically disposed with respect to the respective axes for correcting beam focusing errors; and

d. a pair of spaced apart mirrored electrodes, each having central and first and second outer apertures disposed about the respective axes, for producing central and first and second outer main focusing field lenses for focusing the respective electron beams at the screen.

4,940,918
FLUORESCENT LAMP FOR LIQUID CRYSTAL BACKLIGHTING

Sharon B. Ratfield, North Chelmsford, Mass., assignor to GTE Products Corporation, Danvers, Mass.

Filed Jul. 24, 1989, Ser. No. 383,494
Int. Cl.[5] H01J *1/63*
U.S. Cl. 313—487 **10 Claims**



1. A fluorescent lamp having energy located substantially within a first wavelength band between 400 nanometers and 500 nanometers, a second wavelength band between 500 nanometers and 600 nanometers, and a third wavelength band between 600 and 700 nanometers, said lamp comprising:

a light-transmissive glass envelope having a substantially circular configuration in cross-section;

an electrode operatively positioned proximate each end of said envelope;

an ionizable medium enclosed within said envelope and including an inert starting gas and a quantity of mercury, said ionizable medium when energized generating a plasma discharge comprising ultraviolet radiation and a limited proportion of visible radiation; and

a phosphor means responsive to said ultraviolet radiation generated by the plasma discharge disposed within said envelope and comprising a mixture of different phosphors;

a first component of said phosphor mixture when energized by said ultraviolet radiation having a first energy peak with a predetermined maximum intensity located within a

first wavelength range of from about 435 nanometers to 440 nanometers;

a second component of said phosphor mixture when energized by said ultraviolet radiation having a second energy peak with a predetermined maximum intensity located within a second wavelength range of from about 545 nanometers to 550 nanometers;

a third component of said phosphor mixture when energized by said ultraviolet radiation having a third energy peak with a predetermined maximum intensity located within a third wavelength range of from about 610 nanometers to 615 nanometers;

said maximum intensity of said first energy peak being within the range of from about 70% to 115% of said maximum intensity of said second energy peak, said maximum intensity of said third energy peak being within the range of from about 65% to 87% of said maximum intensity of said second energy peak, said first, second and third energy peaks having bandwidths less than or equal to about 40 nanometers as measured at an intensity which is 50% of a respective maximum intensity.

4,940,919

SUPPORT STRUCTURE FOR VACUUM TUBE COMPONENTS

Richard S. Enck, Jr.; Gregg A. Hindenes, both of San Jose, and Ian K. Glasgow, Palo Alto, all of Calif., assignors to Picker International, Inc., Cleveland, Ohio

Filed Jan. 23, 1989, Ser. No. 303,722

Int. Cl.[5] H01J *1/88, 19/42, 43/00*

U.S. Cl. 313—526 **24 Claims**

1. In a proximity type image intensifier tube having an evacuated, electrically conductive envelope, an input window, an output window, an output display screen on the output window, a high voltage photocathode carrying component mounted between the input window and output display screen, an improved structure for supporting the component within the tube envelope, said structure comprising

a. a support ring comprising a first inwardly extending edge portion forming a component support surface having an inside diameter less than the component diameter, and a second inwardly extending edge portion axially displaced from the first edge portion, said second edge portion forming a component access aperture having an inside diameter greater than the component diameter and a compression surface; and

b. a retaining ring comprising a split spring ring which is contractible to a diameter smaller than the inside diameter of the component access aperture and which is expandable to a diameter larger than the inside diameter of the component access aperture and including a planar inner surface and an outer edge surface, the outer edge surface engageable with the support ring compression surface so that expansion of the retaining ring compresses the component between the retaining ring inner surface and the component support surface.

4,940,920

DEVICE TO SHIELD MASK CATHODE TUBES FROM THE EARTH'S MAGNETIC FIELD

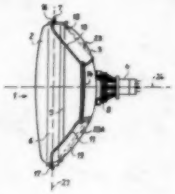
Guiseppe Giannantonio, Anagni, and Cesare de Paolis, Valmontone, both of Italy, assignors to Videocolor, Montrouge, France

Filed Nov. 6, 1987, Ser. No. 117,511

Claims priority, application France, Nov. 7, 1986, 86 15578

Int. Cl.[5] H01J *29/06;* **H01F** *13/00;* **H04N** *9/29*

U.S. Cl. 315—8 **3 Claims**



1. A device to shield mask cathode tubes with shielding screens made of low magnetic permeability material from the earth's magnetic field, said tube having two sides which are substantially horizontal and two sides which are substantially vertical in a normal operating position, said device comprising a demagnetization coil having two oblong-shaped loops with each loop having two large sides, the large sides of which are substantially horizontal, said two loops being fixed substantially on the cone of the cathode tube, and being arranged symmetrically on opposite sides with regard to a horizontal plane passing through the axis of the tube neck, said loops being further connected to a de-magnetizing current generator device, the two large sides of these loops which are furthest from each other being located on the screen side of the frit plane of the tube and the two large sides of these loops which are closest to each other are located midway between the side of the deflector nearest the screen and an anode button.

4,940,921

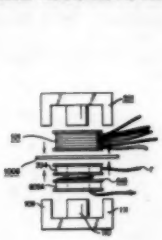
COMBINATION BALLAST AND COLD CATHODE SEALED LAMP AND METHOD

James C. Helling, Newport Beach; Anders W. Beckrot, Laguna Beach, and Scott V. Murray, Huntington Beach, all of Calif., assignors to LumiTech International, L.P., New York, N.Y.

Continuation-in-part of Ser. No. 891,263, Jul. 28, 1986, Pat. No. 4,751,434. This application Dec. 11, 1987, Ser. No. 131,752

Int. Cl.[5] H05B *41/26, 41/36;* **H01F** *27/28*

U.S. Cl. 315—219 **7 Claims**



1. A high frequency, low voltage ballast for a cold cathode tube, comprising in combination:

an output transformer having a secondary winding connected to supply power to said tube;

said transformer having a center tapped primary winding for inducing voltage across said secondary winding;

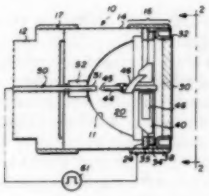
a pair of feedback windings adjacent the primary winding;
an E—E section core, each section comprising first outer leg, a second outer leg and a center leg;
a dielectric bobbin carrying said primary winding and said feedback windings all on the center leg of the first E core section;
a multi-section dielectric bobbin carrying the secondary winding mounted on the center leg of the other E core section with approximately one half of the secondary winding carried in a first section of the multi-section bobbin, and approximately the other half of the secondary winding carried by a different section of the multi-section bobbin in spaced apart relation to the first section;
a pair of switching FETS connected for alternate conduction to establish alternating current in the primary winding for inducing higher voltage alternating current in the secondary winding for operating the tube;
means for receiving a low voltage ac or dc supply voltage to operate the ballast;
means for biasing the FETS from rectified supply voltage; and
means including said feedback windings for establishing said alternate conduction.

4,940,922

INTEGRAL REFLECTOR FLASHLAMP

Felix Schuda, Cupertino, and Roy D. Roberts, Newark, both of Calif., assignors to ILC Technology, Inc., Sunnyvale, Calif.

Filed Dec. 16, 1985, Ser. No. 809,297
Int. Cl.[5] H05B *41/30*
U.S. Cl. 315—246 **4 Claims**



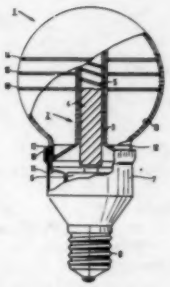
1. A flashlamp having a short-arc comprising:
a hollow body member;
a concave reflector fitted within the body member to define a curved reflecting wall symmetrical about a central axis of the lamp;
a window assembly including a transparent window sealingly mounted to the body member to maintain pressurized inert gas within the space encompassed by the curved reflector and to pass collimated light from the lamp;
inert gas enclosed within the space encompassed by the curved reflector and the window assembly and maintained at a pressure of less than two atmospheres;
first and second opposed electrode members, mounted to extend along said central axis with the distal ends of said electrodes being spaced apart from one another in opposed relationship to define a short-arc gap at the focal point of the concave reflector; and
pulse-producing means connected to the respective electrodes to provide current pulses to the electrodes to practice a luminescent flow of electrons across said short-arc gap between the distal ends of the first and second electrodes, which pulses provide peak currents exceeding about two hundred amperes and which each have durations ranging from about two to ten microseconds.

4,940,923

ELECTRODELESS LOW-PRESSURE DISCHARGE LAMP

Wiggert Kroontje, and Willem J. van den Bogert, both of Eindhoven, Netherlands, assignors to U.S. Philips Corporation, New York, N.Y.

Continuation of Ser. No. 202,769, Jun. 3, 1988, abandoned. This application Nov. 27, 1989, Ser. No. 442,494
Claims priority, application Netherlands, Jun. 5, 1987, 8701315
Int. Cl.[5] H05B *41/16*
U.S. Cl. 315—248 **16 Claims**



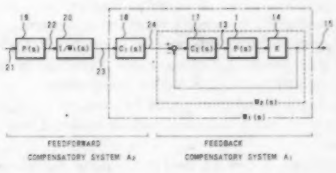
1. An electrodeless low-pressure discharge lamp having a lamp vessel sealed in a gas tight manner, a fill within said lamp vessel comprising metal vapor and a rare gas, said lamp vessel having an outer wall and an inner wall defining a core of said lamp, means disposed in said core for generating a high frequency electric field for exciting said gas fill and producing light, and a transparent electrically conducting layer disposed on the inner surface of said outer wall, wherein the improvement comprises:
a conductive contact member electrically connected to said transparent conducting layer along the major part of the circumference of said inside surface of said outer wall, and
a conductive lead-through extending through said lamp vessel and connected to said conductive contact member.

4,940,924

POSITIONING CONTROL APPARATUS

Shigeki Mizuno; Takaharu Ueda, and Tetsu Yamamoto, all of Amagasaki, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Aug. 3, 1989, Ser. No. 389,059
Claims priority, application Japan, Aug. 22, 1988, 63-207722
Int. Cl.[5] G05D *23/275*
U.S. Cl. 318—560 **17 Claims**



1. A positioning control apparatus for controlling the position of an object having a dynamic characteristic, comprising:
a feedback compensatory system including detecting means for detecting a position of the object and a first compensator connected to the object; and
a feedforward compensatory system including a second compensator operatively connected for signal provision

to said feedback compensatory system, a first filtering means having a dynamic characteristic which is substantially the reverse of the dynamic characteristic to that of a system which is comprised of said second compensator and said feedback compensatory system, and a second filtering means having a dynamic characteristic which is substantially equal to the dynamic characteristic of the object, wherein said second filtering means is operatively connected for signal provision to said first filtering means, and said first filtering means is operatively connected for signal provision to said second compensator.

4,940,925

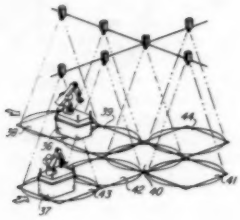
CLOSED-LOOP NAVIGATION SYSTEM FOR MOBILE ROBOTS

Martin A. Wand, Plano; Anh V. Ho, Dallas, both of Tex.; Chuan-Fu Lin, Westboro, Mass.; Phen-Lan Huang, Richardson, Tex.; John P. Williston, Plano, Tex.; Haradon J. Rice, Plano, Tex., and Thomas J. Doty, Dallas, Tex., assignors to Texas Instruments Incorporated, Dallas, Tex.

Continuation-in-part of Ser. No. 129,914, Dec. 4, 1987, which is a division of Ser. No. 771,379, Aug. 30, 1985. This application Oct. 31, 1988, Ser. No. 265,196

Int. Cl.[5] B62D *1/00*

U.S. Cl. 318—587 **10 Claims**



1. A visual navigation system, comprising:

at least one AGV;

a plurality of nodes;

a camera associated with each node for viewing said AGV; and

a navigation system for generating the position of said AGV from an image formed by one of said cameras;

wherein said navigation system has knowledge of an AGV route map and a schedule of planned movements for said AGV, and uses such information to predict and select the camera in whose field of view said AGV can be found.

5. A method of navigating AGVs, comprising:

(a) assigning a plurality of nodes to locations along a route for an AGV such that each node is assigned to a unique location;

(b) positioning a camera near each node for viewing an AGV at or near that node;

(c) using an AGV route map and a schedule of planned movements for said AGV to predict and select the camera in whose field of view said AGV can be found;

(d) using said selected camera to form an image of an identifiable portion of said AGV; and

(e) determining the X-Y position of said AGV from said image.

4,940,926

INSTRUCTION GENERATOR FOR CONTROLLING THE POSITION OF AN ELEMENT, IN PARTICULAR A SLIDING OPENING ELEMENT OF AN AUTOMOBILE VEHICLE

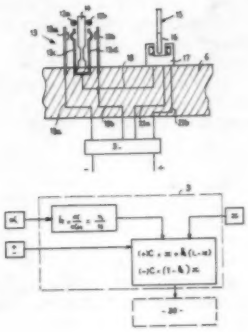
Pierre Periou, Cergy Pontoise, France, assignor to Rockwell-CIM, France

Filed Dec. 12, 1988, Ser. No. 282,667

Claims priority, application France, Dec. 17, 1987, 87 17648

Int. Cl.[5] G05B *1/06, 19/37*

U.S. Cl. 318—603 **6 Claims**



1. Instruction generator for controlling the position of an element in a path through which the element is intended to travel between end-of-travel means, said generator comprising an endless adjusting means and an associated calculator provided with means for determining a proportion of said path as a function of an instruction given to the adjusting means relative to said end-of-travel means wherein the adjusting means comprises an endless rotative control knob capable of turning through a given angle and pulse generating means generating a number of pulses proportional to the angle of rotation of the knob, and means for counting said number of pulses and means for selecting the direction of rotation, the calculator being programmed for producing the instruction of which the position of the element is a direct function, from the number of pulses received by calculating the ratio between said given angle and a maximum angle available to a user, from the position of the element to be controlled and from the direction of the controlled displacement of the element.

6. A method for controlling the position of a movable element in a path between end-of-travel means by means of an instruction generator including a knob, pulse generating means, switching means with electrical contacts, and calculator means, comprising the steps of:

rotating said knob for an angle to a given angle which is less than or equal to a maximum angle available;

generating a number of pulses in said pulse generating means, which is proportional to the angle of rotation;

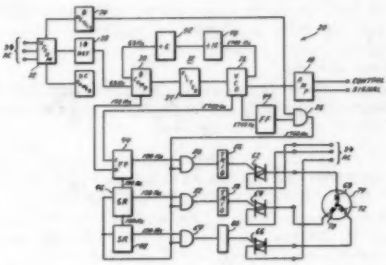
closing respective electrical contacts which correspond to a selection of the direction of rotation; and

counting said number of pulses in said calculator means and producing an instruction of which the position of the element is a direct function from the number of pulses received by said calculator means by calculating the ratio between said given angle and said maximum angle available.

4,940,927
THREE-PHASE A-C SPEED CONTROL FOR VARIABLE TORQUE MOTOR

Marvin J. Fisher, St. Louis, Mo., assignor to Century Electric, Inc., St. Louis, Mo.

Filed Aug. 29, 1985, Ser. No. 770,719
Int. Cl.[5] H02P 5/40
U.S. Cl. 318—809 22 Claims

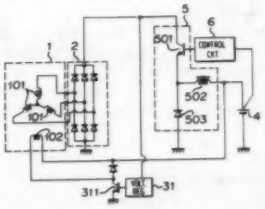


1. A speed control for a three-phase A-C motor, said motor having three windings, said control comprising means for generating a trigger signal indicative of the phase delay desired in switching on a first winding corresponding to a desired speed, delay means to reproduce said trigger signal after a pre-determined time delay to switch on the second and third windings, the trigger signal generating means comprising a constant input frequency phase locked loop, said phase locked loop including a phase comparator, a constant frequency A-C reference source connected to a first input of said phase comparator, a voltage controlled oscillator connected to a second input of said phase comparator, and means to inject a control signal into said voltage controlled oscillator, said control signal being indicative of a desired speed, said voltage controlled oscillator having means to sense said control signal and alter the trigger signal in response thereto, the output of said phase comparator being representative of the trigger signal.

4,940,928
CHARGING GENERATOR APPARATUS

Shinji Nishimura, Himeji, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Jul. 31, 1989, Ser. No. 387,039
Claims priority, application Japan, Aug. 29, 1988, 63-214329
Int. Cl.[5] H02J 7/14
U.S. Cl. 322—28 4 Claims

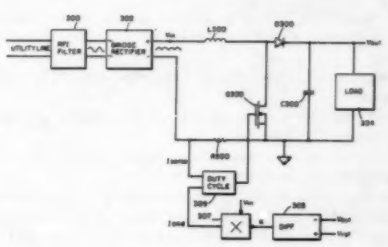


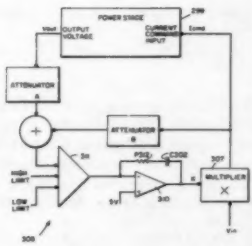
1. A charging generator apparatus which comprises a generator having armature windings and a field winding, a voltage reducing circuit for reducing the output voltage of said generator, a battery to be charged by the output voltage of said voltage reducing circuit, a voltage regulator for regulating the output of said generator by controlling a field current supplied to said field winding and a control circuit for controlling a voltage reducing ratio in said voltage reducing circuit.

4,940,929
AC TO DC CONVERTER WITH UNITY POWER FACTOR

James B. Williams, Westford, Mass., assignor to Apollo Computer, Inc., Chelmsford, Mass.

Filed Jun. 23, 1989, Ser. No. 370,611
Int. Cl.[5] G05F 1/613
U.S. Cl. 323—222 19 Claims





1. An AC to DC converter comprising a circuit which includes an inductor and a diode connected in series with a load capacitor and a shunting switch connected to shunt the diode and load capacitor, the shunting switch being controlled by a control circuit at a frequency which is high relative to the frequency of the AC input, the control circuit comprising:

a differential circuit for comparing an output voltage signal, which indicates the voltage on the load capacitor, to at least one reference to generate a multiplier, such that the product of the multiplier and a voltage input signal indicative of the voltage input to the inductor is proportional to current through the inductor required to provide a desired level of the output voltage, the differential circuit including means to eliminate response of the multiplier to expected ripple in the output signal;

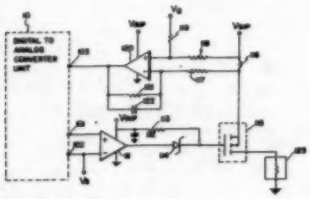
a multiplying circuit for multiplying the multiplier and the voltage input signal to generate a current command signal; and

a duty cycle generator responsive to the current command signal and an inductor current signal, which indicates the current through the inductor, to control the duty cycle of the shunting switch.

4,940,930
DIGITALLY CONTROLLED CURRENT SOURCE

James P. Detweiler, Lansdale, Pa., assignor to Honeywell Incorporated, Minneapolis, Minn.

Filed Sep. 7, 1989, Ser. No. 404,088
Int. Cl.[5] G05F 1/56
U.S. Cl. 323—273 20 Claims



12. A digitally controlled current source for controlling a current through a load impedance, said current source comprising:

a reference impedance coupled in series with said load impedance;

a first amplifier having input terminals coupled across said reference impedance;

a digital to analog converter unit having a feedback terminal coupled to said first amplifier;

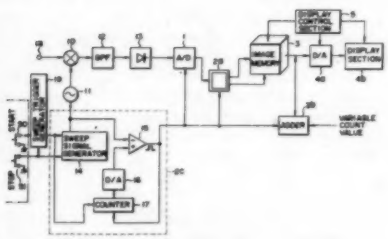
a second amplifier having input terminals coupled to output terminals of said digital to analog converter unit; and

a current control device coupled in series with said load impedance, wherein said second amplifier has an output terminal coupled to a control terminal of said current control device, an output signal from said second amplifier determining a value of a current through said current control device.

4,940,931
DIGITAL WAVEFORM MEASURING APPARATUS HAVING A SHADING-TONE DISPLAY FUNCTION

Aiichi Katayama, Isehara, and Kenichi Kon, Machida, both of Japan, assignors to Anritsu Corporation, Tokyo, Japan

Filed Jun. 20, 1989, Ser. No. 368,868
Claims priority, application Japan, Jun. 24, 1988, 63-157629; Jan. 10, 1989, 1-2131
Int. Cl.[5] G01R 13/20, 13/26
U.S. Cl. 324—121 R 29 Claims



1. A digital waveform measuring apparatus comprising:

address generating means for generating an address corresponding to a magnitude of an input signal for each of a number of sweep timing dots;

frame buffer memory means for storing data corresponding to each timing dot and to the address generated by the address generating means, the data representing the existence of a waveform to be observed;

weight computing means for, upon the occurrence of a coincidence between an address generated by the address generating means with a given sweep timing dot and an address generated by the address generating means with the next sweep timing dot, weighting the data stored in the address which is generated with the given sweep timing dot and for outputting the weighted data to the frame buffer memory;

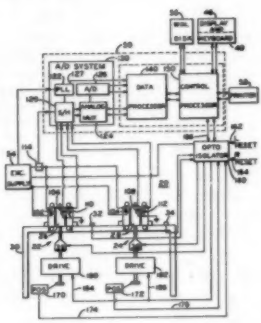
said weight computing means further including means for outputting color data corresponding to the number of occurrences of the same address generated for each sweep timing dot; and

display means for receiving the weighted data from the frame buffer memory and for displaying it as a waveform.

4,940,932
METHOD AND APPARATUS FOR TESTING DYNAMOELECTRIC MACHINE ROTORS

Phillip R. Herrick; Daniel C. Ewing; Floyd H. Wright, and Kevin M. Truelove, all of Fort Wayne, Ind., assignors to General Electric Company, Fort Wayne, Ind.

Division of Ser. No. 860,240, May 6, 1986, Pat. No. 4,801,877.
This application Nov. 10, 1988, Ser. No. 269,500
Int. Cl.[5] G01R 31/06
U.S. Cl. 324—158 MG 16 Claims



1. A method for testing dynamoelectric machine rotors, comprising the steps of:

imparting angular movement to a rotor, and magnetizing the rotor utilizing alternating current during such angular movement;

generating a voltage signal in response to magnetic flux generated by the rotor in response to the magnetization of the rotor during rotation;

sensing the magnitude of the alternating current utilized to magnetize the rotor and generating a current signal responsive thereto; and

determining at least one of the resistance and reactance of the rotor based upon the voltage signal and current signal.

4,940,933
FIBER OPTIC ARC MONITOR

Maurice A. Jenkins, Casselberry, Fla., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Apr. 13, 1989, Ser. No. 337,605
Int. Cl.[5] G01R 31/02
U.S. Cl. 324—158 MG 17 Claims

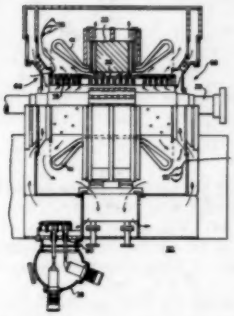
1. An apparatus for detecting arcing in an enclosed electrical device, the apparatus comprising:

a radio-frequency monitor disposed adjacent the electrical device;

a plurality of individual fiber optic cables arranged in predetermined positions within the electrical device for detecting light incident to said arcing; and

monitoring means for providing a signal external to the electrical device when radio-frequency signals are detected by the radio-frequency monitor and light is detected by said light sensing means, wherein said monitoring means is further comprised of:

means for determining the intensity of light detected by each of said fiber optic cables;



means for converting said detected light into an electrical signal equivalent to the intensity of the light received by each of said fiber optic cables;

means for comparing said equivalent electrical signals with respect to the position of each of said fiber optic cables; and

means for indicating the location within the electrical device where the arcing has occurred based upon said comparison.

4,940,934

METHOD OF ELECTRICALLY TESTING ACTIVE MATRIX SUBSTRATE

Takao Kawaguchi, Hirakata; Tatsuhiko Tamura, Neyagawa, and Etsuya Takeda, Suita, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Osaka, Japan

Filed Oct. 14, 1988, Ser. No. 262,340

Claims priority, application Japan, Oct. 15, 1987, 62-260305

Int. Cl.[5] G01R *31/02, 31/28*

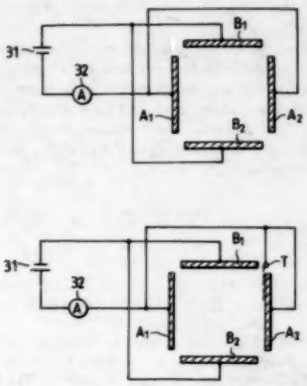
U.S. Cl. 324—158 R **6 Claims**

1. A method of electrically testing an active matrix substrate having a plurality of thin-film transistors each comprising first and second electrodes and a control electrode, pixel electrodes each having an open end facing said second electrode of each of said thin-film transistors so as to form a capacitor, a first group of a plurality of parallel conductors and a second group of a plurality of parallel conductors which are substantially normal to said conductors of said first group to form a matrix, each of said control electrode of said thin-film transistors being connected to one of said conductors of said first group and each of said first electrode of said thin-film transistors being connected to one of said conductors of said second group, said method comprising the steps of:

(a) short-circuiting said conductors of said first group at both ends thereof;

(b) short-circuiting said conductors of said second group at both ends thereof;

(c) applying a predetermined voltage between said first and second groups of said conductors; and



(d) measuring a current flowing from said first group of said conductors to said second group of said conductors or vice versa.

4,940,935

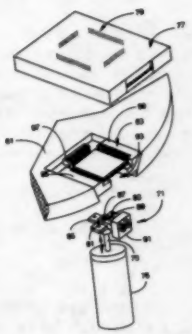
AUTOMATIC SMD TESTER

Bryan R. Riley, San Jose, Calif., assignor to Ried Ashman Manufacturing, Santa Clara, Calif.

Filed Aug. 28, 1989, Ser. No. 400,563

Int. Cl.[5] G01R *31/02*

U.S. Cl. 324—158 F **9 Claims**



1. Apparatus for automatically testing SMDs having leads with surfaces for contacting mounting pads on PCBs comprising:

nest means for carrying said SMDs, said nest means having ledges for contacting said leads such that said nest means supports said SMD by said leads alone without contacting the body of said SMD;

carrier means for supporting and translating said nest means such that said nest means may be elevated above said carrier means and replaced therein;

transfer means for picking up said SMDs from storage containers and placing said SMDs in said nest means and for

picking up said SMDs from said nest means and replacing said SMDs in said storage containers;

test socket means positioned above said carrier means for contacting said leads of said SMDs, thereby connecting said leads to circuitry for performing electrical tests on said SMDs; and

elevation means for engaging said nest means, elevating said nest means above said carrier means and inserting said nest means into said test socket means such that said leads are connected to said circuitry, and for withdrawing said nest means from said test socket means after performance of said electrical tests and replacing said nest means in said carrier means.

4,940,936

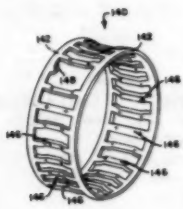
ANTIFRICTION BEARING WITH A CLIP-ON SENSOR COOPERATING WITH A SHAFT MOUNTED MAGNETIC ENCODER RETAINER RING

John M. Grillo, Torrington; James A. Hilby, Watertown; Vern V. Fleet, Wolcott; Cameron G. Gardella, Woodbury, and Gary J. Hill, Collinsville, all of Conn., assignors to The Torrington Company, Torrington, Conn.

Filed Feb. 24, 1989, Ser. No. 315,624

Int. Cl.[5] G01P *3/487, 3/488;* F16C *32/00*

U.S. Cl. 324—174 2 Claims



1. An encoder retainer ring for use with a magnetic encoder ring on a rotatable shaft, said retainer ring comprising two annular end rims joined by multiple crossbars which are adapted to make a press fit with said shaft, and means for connecting said retainer ring to said encoder ring comprising at least one of said crossbars being partially cut away so as to leave a partial crossbar, said partial crossbar having a portion which is bent radially outwardly, said portion engaging a groove formed in the inner surface of said magnetic encoder ring.

4,940,937

PULSE GENERATING RING FOR ELECTROMAGNETIC ROTARY POSITION DETECTION

Kenji Hattori, Wako, Isuneo Yamada, Kuwvana, both of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo and NTN Corporation, Osaka, both of, Japan

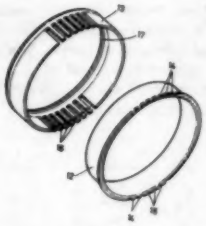
Filed Aug. 15, 1989, Ser. No. 394,029

Claims priority, application Japan, Aug. 18, 1988, 63-206528

Int. Cl.[5] G01B *7/30*

U.S. Cl. 324—207.22 1 Claim

1. A pulser ring comprising an inner ring made from a steel plate, and an outer ring made from a steel plate, said inner ring being formed at one end thereof with a plurality of protrusions equally angularly spaced therebetween and extending radially outwardly, said outer ring being formed with a plurality of teeth arranged with equal angular spacings so as to extend axially, said outer ring being fitted on said inner ring with said teeth on said outer ring held in grooves formed between said protrusions on said inner ring, the tips of said teeth bent inwardly against the end of said inner ring to couple said outer ring with said inner ring.



4,940,938

METHOD AND DEVICE FOR MEASURING CHARACTERISTIC MAGNETIC DISTRIBUTION OF A MAGNETIC THIN FILM USING A MAGNETIC HEAD

Seishi Naito; Shuji Tanabe, and Toru Nakashima, all of Himeji, Japan, assignors to Glory Kogyo Kabushiki Kaisha, Hyogo, Japan

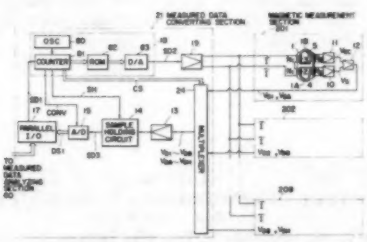
Filed Mar. 2, 1988, Ser. No. 163,104

Claims priority, application Japan, Mar. 2, 1987, 62-47176; Jun. 15, 1987, 62-148736

The portion of the term of this patent subsequent to Feb. 13, 2007, has been disclaimed.

Int. Cl.[5] G01R *33/12*

U.S. Cl. 324—212 18 Claims



6. A measurement device for measuring magnetization characteristics of a magnetic thin film comprising:

a differential type magnetic head having plural magnetic cores and at least one cancellation core for simultaneously measuring plural locations on the magnetic thin film;

an excitation signal generating means for exciting the differential magnetic head with repetitive signals;

a measured data converting means for consecutively sampling plural differential output voltages from the differential type magnetic head, said differential type magnetic head being positioned on or near the magnetic thin film, and for converting the thus sampled values into digital values; and

a measured data analyzing means for consecutively storing the thus converted digital values from the measured data converting means, and for calculating magnetization characteristics of said plural locations on the magnetic thin film said measured data analyzing means including means for detecting differential output voltages V_D and V_{D1}, said differential output voltage V_D being a voltage output from the secondary coil when the magnetic film is in contact with or in proximity to the gap, said differential

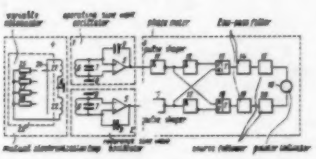
voltage V_{D1} being a voltage output from the secondary coil when the magnetic thin film is neither in contact with nor in proximity to the gap, and further including means for calculating a difference voltage V_D' by subtracting the voltage V_D from the voltage V_{D1}.

4,940,939

APPARATUS WITH INDUCTIVE LOOP SYNCHRONIZED OSCILLATORS FOR MEASURING THE MAGNETIC CONTENT OF NON-METALLIC SAMPLES

Alexandr L. Khait, prospekt; Kultury, 17, kv. 8; Boris A. Glagovsky, prospekt Morisa Toreza, 15, kv. 49; Larisa R. Frenkel, ulitsa Butlerova, 8, kv. 101, all of Leningrad, and Vera S. Los, ulitsa Komsomolskaya, 21, kv. 24, Sosnovy Bor, all of U.S.S.R.

Filed Mar. 9, 1989, Ser. No. 321,014
Int. Cl.[5] G01R *33/12*; G01N *27/72*; H03B *27/00*
U.S. Cl. 324—236 **2 Claims**



1. An apparatus for measuring the magnetic content of non-metallic samples, comprising:

an operating sine wave oscillator including a resonant circuit with an inductance coil adapted to receive a test sample, said operating oscillator having an output;

a reference sine wave oscillator including a resonant circuit having a tuning frequency equal to that of said resonant circuit of said operating oscillator, said reference oscillator having an output;

a phase meter connected to said outputs of said operating and reference oscillators and measuring a phase shift between oscillations of said operating and reference oscillators as the test sample is placed inside said inductance coil of said resonant circuit of said operating oscillator; and

a neutral synchronization loop for synchronizing said operating and reference oscillators, comprising a pair of inductance coils inductively coupled with said coils of the resonant circuits of said operating and reference oscillators, and a switchable resistive attenuator for varying the resistance of said mutual synchronization loop according to the magnetic content of the test sample, said switchable resistive attenuator being included between the terminals of the inductance coils not connected with a common bus, so that the phase shift between the oscillations of said operating and reference oscillators, with any amount of the magnetic material in the test sample within the specified measuring range, will not exceed 30°.

4,940,940

METHOD OF RADIO-FREQUENCY EXCITATION IN AN NMR EXPERIMENT

Patrick Leroux, Gif sur Yvette, France, assignor to General Electric CGR SA, Paris, France

PCT No. PCT/FR87/00260, § 371 Date Jan. 10, 1989, § 102(e) Date Jan. 10, 1989
PCT Filed Jul. 2, 1987, Ser. No. 309,798
Claims priority, application France, Jul. 11, 1986, 86 10179
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—309 **3 Claims**

1. A process for electromagnetic excitation, by a radio-frequency signal, of nuclear particles of a body under examination, said process being performed in a nuclear magnetic resonance device and said nuclear particles being contained in a predetermined investigation volume of said device and subjected to said excitation wherein said device includes a means for applying said excitation to said body as well as electronic data processing means wherein flips of magnetic moments of aid nuclear particles are imposed with amplitudes and phases for a given set of resonance frequencies wherein said given set of resonance frequencies includes all frequency components involved in said investigation volume by said excitation, in response to said excitation, said process comprising the steps of:

introducing a Schrodinger equation in said data processing means relative to a probability amplitude of a wave function of spins of said particles which are resonant at a given resonance frequency, an Hamiltonian of said Schrödinger equation being constituted by a function dependent on a frequency and a shape of an excitation pulse applied to said spins;

integrating said Schrodinger equation with respect to time in said data processing means and deducing therefrom polynominal analytical expresaions of said probability

amplitude at the end of said excitation pulse, as a function of a variable representing said resonance frequency wherein said variable is present in said polynominal analytical expression at a degree equal to a number of elementary periods and wherein a sum of durations of said elementary periods is equal to a duration of said pulse and said variable being weighted in said polynominal analytical expressions by coefficients representative of the actual excitation profile caused by said excitation pulse and undergone, during said periods, by said spins, said coefficients being a function of a location variable of said investigation volume;

optimizing said coefficients by said data processing means in order that said polynominal analytical expressions approach as nearly as possible a desired predetermined form;

deducing from said optimized coefficients, for each of said elementary periods, characteristics of said excitation pulse leading to said desired predetermined frequency and shape of said flips of magnetic moments; and

exciting said particles of said volume with said excitation signal.

4,940,941

METHOD OF HIGH-SPEED MAGNETIC RESONANCE IMAGING

Richard R. Rzedzian, Lexington, Mass., assignor to Advanced NMR Systems, Inc., Woburn, Mass.

Continuation-in-part of Ser. No. 109,091, Oct. 16, 1987, Pat. No. 4,818,942, which is a continuation-in-part of Ser. No. 937,529, Dec. 3, 1986, Pat. No. 4,740,748. This application Apr. 3, 1989, Ser. No. 331,806
The portion of the term of this patent subsequent to Apr. 26, 2005, has been disclaimed.
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—312 **39 Claims**

1. A method of deriving image information at high speed from an object using nuclear magnetic resonance signals, comprising the steps of:

(a) subjecting an object to continuous static magnetic field

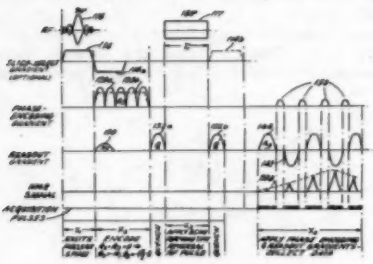
along an axis, said magnetic field having a strength between about 0.5 and 5 Tesla;

(b) exciting nuclear spins in the object by applying to the object a first radio frequency pulse, such that free induction decay signals are produced by said excited nuclear spins;

(c) applying to the object an encoding sequence comprising a magnetic field gradient in a first direction together with a magnetic field gradient in a second direction different than said first direction;

(d) applying a second radio frequency pulse to the object;

(e) applying a readout sequence comprising a series of alternate applications to the object, respectively in time, of



magnetic field gradient in said second direction defining readout gradients and magnetic field gradient in said first direction defining phase-encoding gradients, said readout sequence being completed within a period of time less than about 100 milliseconds; and

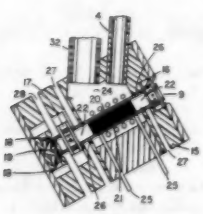
(f) acquiring data to form a magnetic resonance image by sampling nuclear magnetic resonance signals output from said object during the application of said readout gradients to form a series of data values in the time domain, formatting said time domain data into modified data estimating the spatial frequencies of the object and transforming said modified data into spatial domain data for presentation as an image of the object.

4,940,942

METHOD AND APPARATUS FOR CONDUCTING VARIABLE-TEMPERATURE SOLID STATE MAGNETIC RESONANCE SPECTROSCOPY

Victor J. Bartuska, 1600 Brentford La., and David H. Lewis, 502 N. Shields, both of Fort Collins, Colo. 80521

Filed Apr. 14, 1989, Ser. No. 339,053
Int. Cl.[5] G01R *33/20*
U.S. Cl. 324—321 **43 Claims**



1. A method of performing variable-temperature, solid state magnetic resonance spectroscopy comprising the steps of:

a. placing a solid state sample in a rotor;

b. positioning said rotor within a magnetic field;

c. spinning said rotor through operation of at least one spinning gas;

d. creating a temperature gradient among the gases surrounding said rotor to impact the temperature of said solid state sample;

e. affirmatively confining said temperature gradient to areas of the rotor away from said solid state sample; and

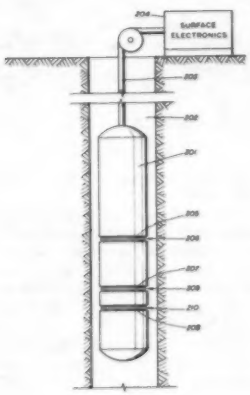
f. reading the magnetic resonant emissions of said sample.

4,940,943

METHOD AND APPARATUS FOR OPTIMIZING THE RECEPTION PATTERN OF THE ANTENNA OF A PROPAGATING ELECTROMAGNETIC WAVE LOGGING TOOL

Roger P. Bartel, and Paul F. Rodney, both of Houston, Harris County, Tex., assignors to Baroid Technology, Inc., Houston, Tex.

Filed Apr. 19, 1988, Ser. No. 183,695
Int. Cl.[5] G01V *3/30*
U.S. Cl. 324—338 **38 Claims**



1. An apparatus for measuring a formation parameter about a borehole traversing an earth formation and containing drilling fluid, comprising:

a tubular, electrically conductive housing means having a longitudinal axis therethrough and threaded at each end for threaded engagement in a drill string above the drill bit and including a passage suitable for conveying drilling fluids therethrough;

means for transmitting electromagnetic energy into the formation surrounding said housing means, said transmitting means disposed about the exterior or said housing means, said transmitting means including a first current loop antenna located in a first cutout of said conductive housing having a length in the range of one to four inches, as measured along said longitudinal axis, said first cutout being annular about the exterior of said tubular housing and being coaxial with said longitudinal axis; and

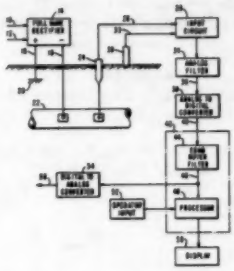
means for receiving electromagnetic energy from said formation, said receiving means including a second current loop antenna located in a second cutout of said conductive housing having a length of one to four inches, as measured along said longitudinal axis, said second cutout being annular about the exterior of said tubular housing and being coaxial with the said longitudinal axis; and a third current loop antenna located in a third cutout of said conductive housing having a length of one to four inches, as measured along said longitudinal axis, said third cutout being annular about the exterior of said tubular housing and being coaxial with said longitudinal axis.

4,940,944

CATHODIC PROTECTION ANALYZER IN WHICH THE FUNDAMENTAL AND ODD HARMONICS OF A POWER LINE FREQUENCY ARE REMOVED

David S. Steele, Wyoming; Randolph K. Armstrong, Cincinnati, and David E. Snider, Pleasant Plain, all of Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 16, 1989, Ser. No. 311,506
Int. Cl.[5] G01N 27/42
U.S. Cl. 324—425 8 Claims



1. A method of measuring cathodic protection voltage, said method comprising the steps of:

receiving a first signal representative of an externally applied, full wave rectified power line frequency cathodic protection potential, said first signal being subject to electrical interference;

removing a fundamental power line frequency component and odd harmonics of said power line frequency component from said first signal, thereby producing a filtered signal; and

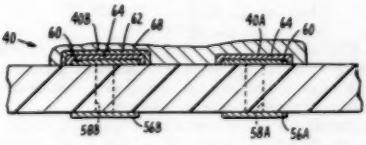
measuring the integral of the filtered signal over a period in which said filtered signal exceeds a predetermined magnitude, to produce an indication of the adequacy of the cathodic protection potential.

4,940,945

INTERFACE CIRCUIT FOR USE IN A PORTABLE BLOOD CHEMISTRY MEASURING APPARATUS

Douglas J. Littlejohn, Sunnyvale, and Richard L. Fellows, Mountain View, both of Calif., assignors to Biologix Inc., Cupertino, Calif.

Filed Nov. 2, 1987, Ser. No. 116,015
Int. Cl.[5] G01N 27/06
U.S. Cl. 324—438 5 Claims



1. An apparatus for measuring a signal having a high source impedance of the type in which the signal to be measured is presented across a pair of contacts, and a measuring circuit is placed in physical contact with the pair of contacts, comprising

interface means having a plurality of contacting structures which can be placed in physical contact with and at spaced apart points on at least a first one of the pair of contacts for circulating a current through the first one of the pair of contacts by way of the plurality of contacting structures, wherein the circulating current flows out of one of the plurality of contacting structures, through the first one of the pair of contacts, and into another of the plurality of contacting structures, and further wherein the magnitude of the circulated circuit is selected to cause a low ohmic contact to be developed between the plurality of contacting structures and the first one of the pair of contacts;

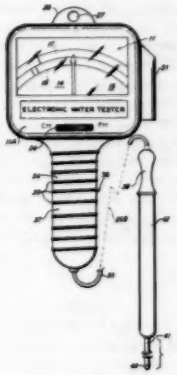
means for measuring the signal between one of the plurality of contacting structures and the other of the pair of contacts.

4,940,946

POOL WATER SENSOR WITH AN EXTENDIBLE PRONGED PROBE FOR DETERMINING PH AND CHLORINE LEVELS

Sampson Nazaryan, 17955 Arenth Ave., City of Industry, Calif. 91748

Filed Dec. 13, 1988, Ser. No. 284,012
Int. Cl.[5] G01N 27/416, 27/02
U.S. Cl. 324—438 6 Claims



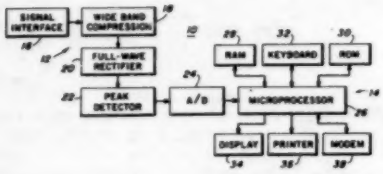
1. A hand-held, portable, self-contained, battery-operated electrical sensor for separately measuring levels of acidity and chlorine concentration of water in a swimming pool which comprises a sensor case, a meter including a pair of meter scales and a meter needle with said sensor case, an on-off electrical switch ganged to a movable tap of a variable control resistor electrical circuit for operating said meter needle, said on-off electrical switch and said variable control resistor being operable together from the case exterior to separately determine acidity and chorine, a sensor probe, a holster adapted to removably hold said sensor probe to said sensor case, said sensor probe including a probe head, spaced apart elongate metallic probe elements extending from said probe head, said elongate metallic probe elements including spaced tips, an extendible flexible electrical cable connecting between said sensor probe elements and said control resistor in the case interior, means for viewing said meter from said case exterior, and a battery chamber within said sensor case, said electrical sensor comprising an electrical circuit with said on-off electrical switch in an open position for separately determining pool water acidity and an electrical circuit with said on-off switch in a closed position for determining water chlorine conditions upon immersion of said sensor probe elements into said water of said swimming pool.

4,940,947

LINE NOISE SIGNAL MEASUREMENT SYSTEM USING ANALOG SIGNAL COMPRESSION WITH DIGITAL LINEARITY CORRECTION

Andrew McCartney, Libertyville, and Thomas McCartney, Bannockburn, both of Ill., assignors to Oneac Corporation, Libertyville, Ill.

Filed Feb. 28, 1989, Ser. No. 316,798
Int. Cl.[5] G01R 29/26
U.S. Cl. 324—613 **18 Claims**



1. A line noise signal measurement system for measuring noise on lines being monitored, such as AC power lines, comprising:

detecting means coupled to said monitored lines for providing a sensed analog signal of said monitored lines;

compression means coupled to said detecting means for providing an amplitude compressed signal responsive to said sensed analog signal, said compression means having a stepwise substantially linear transfer function responsive to a variable magnitude of said sensed signal; and

signal processing means coupled to said compression means for sequentially generating a digital signal representative of said amplitude compressed signal; and

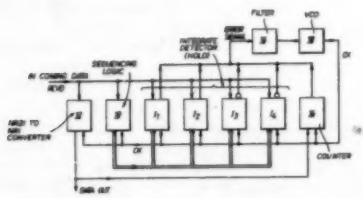
digital processing means coupled to said signal processing means for generating a measured noise signal record responsive to said digital signal, said measured signal record generating means including means for identifying the line noise signal.

4,940,948

CLOCK DRIVEN DATA SAMPLING CIRCUIT

Peter G. Laws, and Graham J. Fletcher, both of Wiltshire, United Kingdom, assignors to Plessey Overseas Limited, England

Filed Mar. 28, 1989, Ser. No. 329,718
Claims priority, application United Kingdom, Mar. 29, 1988, 8807402
Int. Cl.[5] H03D 3/00
U.S. Cl. 329—307 **4 Claims**



1. A circuit for recovering clock information from an incoming data signal including transitions between upper and lower voltage levels, the circuit including a controlled oscillator providing a clock signal to an integrate/hold means which receives an incoming data signal, the integrate/hold means providing an error signal to the controlled oscillator for adjusting the phase thereof to that of the incoming data signal, the integrate/hold means providing within each period of the clock signal three functions: (1) an integration of the incoming data signal in every bit period in which a voltage transition occurs, (2) a holding of the integrated value within a subsequent bit period or periods, and (3) a resetting of the integrated value following the next voltage transition in the incoming data signal, whereby the held integrated value, whose magnitude is dependent of the phase of the clock signal relative to the phase of the incoming data signal, provides said error signal, and

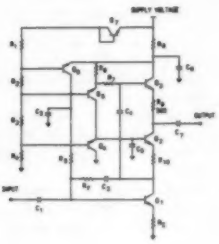
a counter for counting clock periods and being reset in response to recovered data transitions, and being operative to provide a phase error signal to said controlled oscillator upon reaching a predetermined count.

4,940,949

HIGH EFFICIENCY HIGH ISOLATION AMPLIFIER

Ernest D. Landi, Milipitas, Calif., assignor to Avantek, Inc., Milpitas, Calif.

Filed Nov. 1, 1989, Ser. No. 430,629
Int. Cl.[5] H03F 3/30
U.S. Cl. 330—262 **11 Claims**



1. A broadband amplifier comprising a common emitter stage, a common base stage, a common collector stage, and biasing means, wherein the common emitter stage is connected in a cascode configuration to the common base stage, and the common collector stage is connected to the cascode configuration so as to be driven by the common emitter stage in a push-pull configuration with the common base stage.

4,940,950

FREQUENCY SYNTHESIS METHOD AND APPARATUS USING APPROXIMATION TO PROVIDE CLOSELY SPACED DISCRETE FREQUENCIES OVER A WIDE RANGE WITH RAPID ACQUISITION

Albert D. Helfrick, Boonton, N.J., assignor to Tel-Instrument Electronics Corporation, Carlstadt, N.J.

Filed Aug. 12, 1988, Ser. No. 231,458
Int. Cl.[5] H03L 7/00
U.S. Cl. 331—2 **27 Claims**

1. A programmable frequency synthesizer for producing an output signal at a frequency which closely approximates a desired frequency, said synthesizer including:

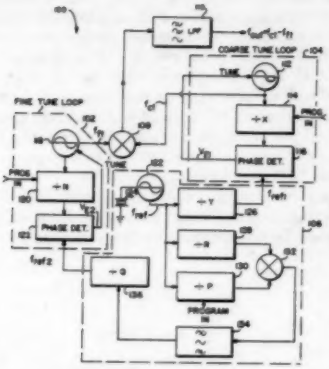
programming means for producing a control signal specifying said desired frequency to within a first frequency spacing;

phase locked loop means for generating said output signal in response to said control signal and also in response to an input reference signal having a frequency exceeding said first frequency spacing;

reference oscillator means for producing a first signal; and

reference frequency altering means operatively coupled to said reference oscillator means and to said programmable means for altering the frequency of said first signal in discrete frequency steps having said first frequency spacing in response to said control signal and for applying said altered first signal to said phase locked loop means as said

input reference signal, said first signal frequency alterations introducing errors in the frequency of said output signal,



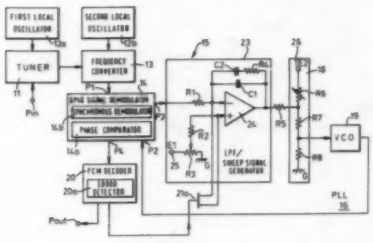
wherein said programming means including means for optimizing the output signal frequency errors introduced by said reference frequency altering means to obtain a close approximation of said desired frequency.

4,940,951

PHASE LOCK RECOVERY APPARATUS FOR PHASE LOCKED LOOP CIRCUIT

Yoshiaki Sakamoto, Saitama, Japan, assignor to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Filed Jan. 27, 1989, Ser. No. 302,714
Claims priority, application Japan, Feb. 1, 1988, 63-22312
Int. Cl.[5] H03L *7/12*; H04L *27/22*
U.S. Cl. 331—4 **4 Claims**



1. A phase lock recovery apparatus for a phase locked loop circuit, the phase locked loop circuit comprising:

a synchronous demodulator section having an output for a demodulated signal;

a phase comparator having an input for a modulated signal, an input for a phase reference signal, and an output for a phase error signal, said output including a low pass filter;

a voltage superposing circuit having a fixed DC voltage source and an input coupled to said phase comparator output;

a voltage controlled oscillator coupled to said superposing circuit, the voltage superposing circuit supplying a superposed voltage to said voltage controlled oscillator; and

the voltage controlled oscillator having an output which supplies the phase reference signal to the respective phase comparator input;

the phase lock recovery apparatus comprising:

detection means coupled to the demodulated output of the synchronous demodulator for detecting a phase unlocked state in the phase locked loop circuit; and

sweep signal generating means responsive to the detection means for sweeping the frequency of the voltage controlled oscillator to come within the lock range of the frequency of the input signal when the phase unlocked state is detected, wherein the sweep signal generating means includes:

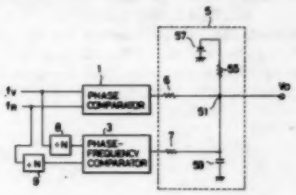
voltage generating means for supplying a prescribed sweep voltage to the phase locked loop circuit, the voltage generating means having an operational amplifier, discharging means coupled to the operational amplifier for controlling the sweep voltage, and a field effect transistor connected to the operational amplifier for controlling the discharging means.

4,940,952

PHASE AND FREQUENCY COMPARATOR CIRCUIT FOR PHASE LOCKED LOOP

Koyo Kegasa, Amagasaki, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Hyogo, Japan

Filed Nov. 7, 1988, Ser. No. 267,549
Claims priority, application Japan, Nov. 9, 1987, 62-282821
Int. Cl.[5] H03D *13/00*; H03L *7/087, 7/10*
U.S. Cl. 331—11 **37 Claims**



1. A phase and frequency detector circuit, comprising:

phase comparator means for receiving a first input signal and a second reference input signal and generating a signal that varies depending on their phase difference;

frequency dividing means for frequency-dividing, by the same factor N, said first input signal and said second reference input signal;

phase-frequency comparator means for receiving the outputs of said frequency dividing means and generating a signal that varies depending on the frequency difference and phase difference of the outputs of said frequency dividing means; and

merging means for receiving the signals generated by said phase comparator means and said phase-frequency comparator means and providing a resultant output signal.

4,940,953

MILLIMETER WAVE MICROSTRIP IMPATT DIODE OSCILLATOR

John R. Lamberg, Minnetonka, Minn., assignor to Honeywell Inc., Minneapolis, Minn.

Filed Sep. 5, 1989, Ser. No. 402,664
Int. Cl.[5] H03B *7/14*
U.S. Cl. 331—96 **5 Claims**

1. A millimeter wave, microstrip IMPATT diode oscillator comprising:

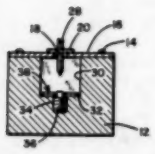
(a) a block of conductive material having a channel of rectangular cross-section formed therein and with a well of a predetermined diameter formed inwardly of said block from the floor of said channel;

(b) a packaged IMPATT diode fitted into said well, said IMPATT diode including a metallized cap projecting out of said well and into said channel;

(c) a microstrip circuit including a dielectric substrate resting on said channel floor, said dielectric substrate includ-

ing a hole for receiving said metallized cap therethrough and a pattern of printed circuit conductors on the surface opposite that resting on said channel floor;

(d) means connecting said metallized cap of said IMPATT diode to said pattern of printed circuit conductors;



(e) a conductive cover secured to said block and overlaying said channel; and

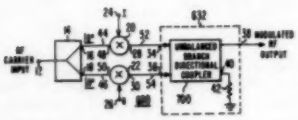
(f) a laterally and vertically adjustable post passing through said cover and into said channel for cooperating with said pattern of printed circuit conductors for adjusting the output of said oscillator.

4,940,954

UNBALANCED QUADRATURE PSK MODULATOR-LIMITER

Donald E. Aubert, Mt. Laurel; You-Sun Wu, Princeton Junction, and Vishnu W. Nerurkar, Plainsboro, all of N.J., assignors to General Electric Company, East Windsor, N.J.

Filed Apr. 12, 1988, Ser. No. 180,497
Int. Cl.[5] H03C 3/00
U.S. Cl. 332—103 13 Claims



1. An apparatus for accurately producing unbalanced quadri-phase shift keyed modulated signals, including an unbalanced quadri-phase shift keyed modulator adapted to be coupled to a source of carrier signal and to sources of first and second information signals to be modulated in unbalanced quadrature onto said carrier for producing unbalanced quadri-phase shift keyed signals, said modulator tending to produce crosstalk if said quadrature relationship is disturbed, wherein said modulator comprises:

in-phase power splitting means including an input port adapted to receive said carrier signal to be modulated, and also including first and second output ports at which equal-amplitude mutually in-phase first and second carriers are generated in response to application of said unattenuated carrier signal to said input port;

first biphase modulation means coupled to said first output port of said power splitting means for receiving said first carrier therefrom, and also including an information input port adapted to be coupled for receiving said first information signals, for biphase modulating said first carrier with said first information signals for producing first modulated carrier signals;

second biphase modulation means coupled to said second output port of said power splitting means for receiving said second carrier therefrom, and also including an information input port adapted to be coupled for receiving said second information signals, for biphase modulating said second carrier with said second information signals for producing second modulated carrier signals;

a 90°, unbalanced hybrid coupler including first and second input ports coupled to said first and second amplitude modulation means, respectively, and also including an output port, for coupling said first modulated carrier signals from said first input port of said hybrid coupler to said output port of said hybrid coupler with reference amplitude and phase, and for coupling said second modulated carrier signals from said second input port of said hybrid coupler to said output port of said hybrid coupler with an amplitude different than said reference amplitude and with a relatively quadrature phase shift, and for vectorially summing the unequal-amplitude, mutually-quadrature first and second modulated carrier signals to produce said unbalance quadri-phase shift keyed signals, said apparatus further comprising:

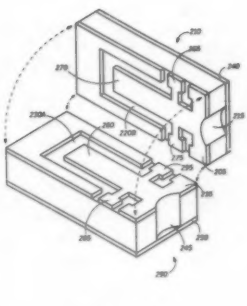
an amplitude limiter coupled to said modulator for limiting the amplitude of said unbalanced quadri-phase shift keyed signals for reducing said tendency to produce crosstalk.

4,940,955

TEMPERATURE COMPENSATED STRIPLINE STRUCTURE

Robert J. Higgins, Jr., Sunrise, Fla., assignor to Motorola, Inc., Schaumburg, Ill.

Filed Jan. 3, 1989, Ser. No. 292,807
Int. Cl.[5] H01P 1/203, 7/08
U.S. Cl. 333—204 21 Claims



1. A stripline structure, comprising:

a first substrate having inner and outer opposed surfaces, and having a first temperature coefficient and a first thickness;

a second substrate having inner and outer opposed surfaces, and having a second temperature coefficient and a second thickness;

said outer surfaces of first and second substrate each being covered by a conductive material constituting ground planes;

at least one resonator device comprising a first conductor having a first width, situated on the inner surface of said first substrate, and a second conductor having a second width, situated on the inner surface of said second substrate; said first and second substrates being constructed and arranged with their respective inner surfaces facing each other and said first and second temperature coefficients having opposite effect on resonant frequency;

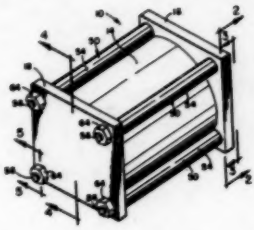
wherein said first and said second thicknesses of said first and second substrate are selected such as to produce a net temperature coefficient of resonant frequency.

4,940,956

BAND-PASS FILTER AND SUPPORT STRUCTURE THEREFOR

William J. Garner, Yardley, Pa., assignor to International Mobile Machines Corporation, Philadelphia, Pa.

Filed Sep. 21, 1988, Ser. No. 247,381
Int. Cl.[5] H01P 1/207
U.S. Cl. 333—209 11 Claims



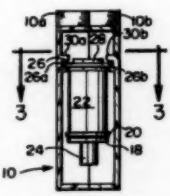
1. A band pass-band reject filter comprising
at least one cylindrical housing,
a first end plate at one end of said housing and a second end plate at another end of said housing,
a plurality of bolts extending from one end plate to the other and being spaced from each other around an outer periphery of said housing,
said bolts being rigidly connected to said first end plate and to the peripheral surface of said housing, and being detachably connected to said second end plate, whereby said housing and said first end plate may be detached as a unit from said second end plate, and
a tuning rod threadedly secured in an aperture in said first end plate and axially movable within said housing along a direction parallel with said bolts.

4,940,957

FLANGE ENGAGEMENT OF CAPTIVE TUBE IN ELECTROMAGNETIC CIRCUIT BREAKERS USING HALF SHELLS

Konrad J. Richter, Sr., Lawrenceville, N.J., assignor to Heinemann Electric Company, Lawrenceville, N.J.

Filed Feb. 22, 1989, Ser. No. 314,172
Int. Cl.[5] H01H 9/02
U.S. Cl. 335—202 4 Claims



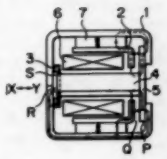
1. An electromagnetic circuit breaker having a pair of breaker switch contacts electrically connected in series with a magnetic coil comprising an insulating breaker housing having a pair of opposed housing shell members, at least in the region of the coil, which members are opened to assemble the breaker structure and closed and clamped together to contain the operating structure, including at least an actuation linkage for opening and closing the switch contacts supported on a frame which is fixed to the housing and having actuation means to open and close the switch contacts and a movable armature attractable to a pole piece for opening the switch contacts on overload, the pole piece terminating a non-magnetic tube containing and guiding a magnetic core, the non-magnetic tube being located within the magnetic coil and having a radially extending tube flange at an end terminated in the pole piece, the actuating linkage and a coil supporting bobbin being supported on the frame, the tube flange being engaged by shoulders on the respective opposed sidewalls of the interior of the housing so that pressure is applied to urge the tube flange against its supporting surface and clamp in place the flange and all structure between the flange and the frame.

4,940,958

POLARIZED ELECTROMAGNETIC APPARATUS

Shigeharu Ootsuka, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 26, 1989, Ser. No. 413,002
Claims priority, application Japan, Sep. 29, 1988, 63-245000
Int. Cl.[5] H01F 7/08
U.S. Cl. 335—230 3 Claims



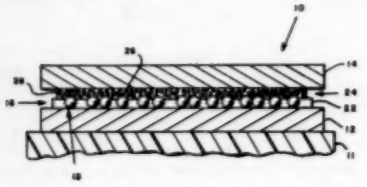
1. A polarized electromagnetic apparatus having a movable core assembly, said core assembly being driven by a combined attractive force of a permanent magnet and an electromagnetic coil against a reset spring force when the electromagnetic coil is energized and said movable core assembly being driven by the reset spring force when the electromagnetic coil is de-energized, comprising:
at least one stationary core (1) having a substantially U-shaped cross section, said U-shaped cross section having a first leg and a second leg opposing each other and an inner surface;
a permanent magnet (7) having a first pole and a second pole, said first pole being in contact with said inner surface of said stationary core (1);
a pole plate (2) in contact with said second pole and forming a first clearance (P,Q) between said second leg;
an electromagnetic coil (6) disposed between said first and second legs;
a bar-shaped movable core (4) disposed between said first and second legs and movably extending through said electromagnetic coil (6), said bar-shaped movable core (4) having a first end and a second end, said bar-shaped movable core (4) having a movable core plate (5) which is secured at said first end of said bar-shaped movable core and extends into said first clearance (P,Q), said bar-shaped movable core (4) displaces in a longitudinal direction thereof to a first position where said movable core plane (5) is attracted by and contacts with said second leg when said electromagnetic coil (6) is de-energized and to a second position where said second end of said bar-shaped movable core (4) is attracted by and contacts with said first leg when said electromagnetic coil (6) is energized;
a pole piece (3) secured to said first leg and having a hole (20) therein through which said bar-shaped movable core (4) displaces to said second position.

4,940,959

REVERSIBLE RESISTANT DEVICE

Claude Zeller, Monroe; Henry A. Mayeski, Norwalk, and Charles F. Murphy, III, Fairfield, all of Conn., assignors to Pitney Bowes, Inc., Stamford, Conn.

Continuation of Ser. No. 71,237, Jul. 9, 1987, abandoned. This application Aug. 3, 1989, Ser. No. 388,742
Int. Cl.[5] H01C 7/00
U.S. Cl. 338—13 5 Claims



1. A reversible resistant device comprising:
a first conductive layer,
a second conductive layer opposed relative to said first conductive layer,
a normally non-conductive film disposed intermediate said first and second conductive layers,
said normally non-conductive film comprising metal particles having a non-conductive coating thereover disposed within a first binder, and
a conductive film located intermediate said normally non-conductive film and said second layer, said conductive film comprising metal particles dispersed within a second binder,
said metal particles protruding from said first binder up to 25% of their diameter,
whereby upon being exposed to an electrical force said non-conductive coating breaks down to render said normally non-conductive film conductive.

4,940,960

HIGHLY DENSIFIED VOLTAGE NON-LINEAR RESISTOR AND METHOD OF MANUFACTURING THE SAME

Hiroshi Nemoto, Nagoya; Koichi Umemoto, Toyota, and Shinji Kawasaki, Nagoya, all of Japan, assignors to NGK Insulators, Ltd., Japan

Filed Dec. 16, 1988, Ser. No. 285,528
Claims priority, application Japan, Dec. 22, 1987, 62-322992; Nov. 24, 1988, 63-294501
Int. Cl.[5] H01C 7/00, 7/10
U.S. Cl. 338—13 11 Claims

1. A voltage non-linear resistor comprising:
a sintered body comprising zinc oxide as a primary constituent; and
at least one additive which exhibits voltage non-linearity in the sintered body;
wherein said sintered body has a relative density of at least 97%.

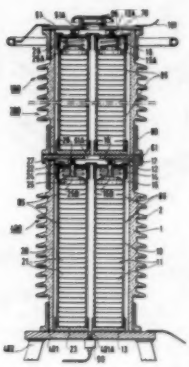
4,940,961

BRAKING RESISTOR FOR A HIGH TENSION ELECTRICAL NETWORK

Edmond Thuries; Van Doan Pham, both of Meyzieu, and Roger Ledru, Pont De Cheruy, all of France, assignors to Societe Anonyme dite : Alsthom, Paris, France

Filed Dec. 30, 1988, Ser. No. 292,162
Claims priority, application France, Dec. 30, 1987, 87 18412
Int. Cl.[5] H01C 7/10
U.S. Cl. 338—21 9 Claims

1. A braking resistor comprising:
at least one basic element comprising a ceramic envelope receiving at least one stack of conducting solid disks made of a carbon-based ceramic and having resistivity lying in the range 100 Ω.cm to 1000 Ω.cm;
means for maintaining said stack;
means for exerting pressure on the stack of disks; and
means for providing electrical contact between the ends of each stack and respective conducting plates located at the ends of the envelope, the improvement wherein said envelope is filled with nitrogen at a pressure of 1 to 2 bars, said means for holding or maintaining stack is a tube of epoxy



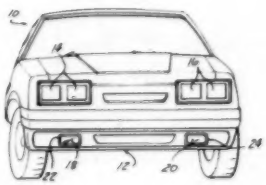
glass with the disks being placed inside the tube, and said tube including a plurality of orifices through a tube wall for enhancing nitrogen flow about said stack of conducting solid disks whereby heat is dissipated and internal electrical insulation is enhanced by the pressure of low pressure nitrogen extending over the length of the resistor tube thereby providing a voltage gradient no greater than 500 V/cm with energy absorption by the braking resistor in one second on the order of 370 joules/cm, and wherein the braking resistor has a very low self-inductance.

4,940,962

FRONT MOUNTED VEHICLE BRAKING INDICATOR

Jerry L. Sarokin, 33632 Old Timber, Farmington Hills, Mich. 48018

Filed Feb. 22, 1988, Ser. No. 158,878
Int. Cl.[5] B60Q 1/44
U.S. Cl. 340—479 4 Claims



1. An indicator apparatus for use on a vehicle having a depressible brake pedal comprising:
a first light and a second light spacedly mounted a predetermined distance apart on opposite sides of the front of the vehicle and separately viewable from the front of the vehicle as two separate lights;
first means for sensing the initial depression of the brake pedal;
second means for sensing further depression of the brake pedal; and
means, responsive to the first and second sensing means, for

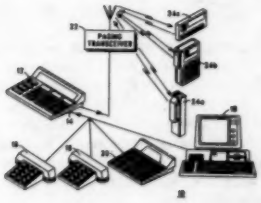
actuating the first light at the initial depression of the brake pedal and the second light in combination with the initially actuated first light during further depression of the brake pedal.

4,940,963

PAGING SYSTEM WITH IMPROVED ACKNOWLEDGE-BACK CAPABILITIES

Jose Gutman, Boynton Beach, and Steven C. Shapiro, Lake Worth, both of Fla., assignors to Motorola Inc., Schaumburg, Ill.

Filed Mar. 10, 1989, Ser. No. 322,159
Int. Cl.[5] H04Q 7/00
U.S. Cl. 340—313 **22 Claims**



1. In a paging system with a central base station and a plurality of remote pager units, an arrangement for indicating the status of a particular paging call, comprising in combination:

indicator means on the pager unit;

means for receiving a paging signal by the pager, activating said indicator means for a set interval, and sending back an automatic response thereto to indicate a received address;

means for receiving an associated message by the pager; and

means for manually responding or not responding during said set interval,

by manually responding during said interval, an affirmative response is sent back to the base station as an indication that said message has been received and which is so indicated to the initiating caller,

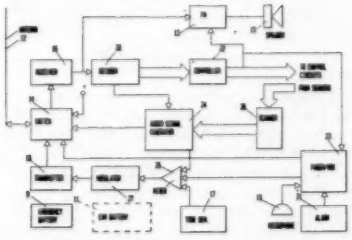
by not manually responding within said interval, a negative response is sent back to the base station which is likewise indicated to the initiating caller.

4,940,964

VEHICLE CONTROL AND THEFT DETERRENT WITH REMOTE TRANSMITTER

Victor Dao, 1401 N. Fawn St., Santa Ana, Calif. 92703

Filed Dec. 4, 1989, Ser. No. 444,988
Int. Cl.[5] B60Q 1/00
U.S. Cl. 340—438 **12 Claims**



1. A theft deterrent system and remote control for a plurality of vehicle functional operations, in which the vehicle has an electrical system including an ignition system, an electrical engine starter and a heating or cooling system which comprises

a. a vehicle control system mounted in the vehicle, in circuit to the battery of said vehicle, and including:

(1) a vehicle receiver and antenna to receive a selected band of radio frequency broadcast control signals;

(2) a decoder in circuit to said receiver to process a received signal and to recognize a preselected coded signal;

(3) a plurality of controller circuits, one each for each of the automotive functional operations to enable operation of one of the ignition system, engine starter, and heating or cooling systems of said vehicle, each responsive to a preselected signal code and each having an output control operative to actuate its respective functional operation under control;

(4) a conditions scanning circuit having a plurality of sensors, one each for each of the automotive functional operations of ignition system, engine starter, and heating or cooling systems and responsive thereto to generate a return signal;

(5) an audible signal generator responsive to said conditions scanning circuit to generate an audible tone of a preselected frequency;

(6) a vehicle transmitter in circuit to said tone generator and operative to transmit a second selected band of radio frequency signal in response thereto;

b. a hand-held remote control unit, having a self containing electrical power source, and including:

(1) a keypad comprising a plurality of key switches;

(2) an encoder in circuit to said key switches and responsive thereto to generate a coded signal;

(3) a remote transmitter in circuit to said encoder and responsive thereto to generate and transmit a radio frequency signal of said first frequency containing said coded signal;

(4) a remote receiver and receiving antenna to receive said return signal; and

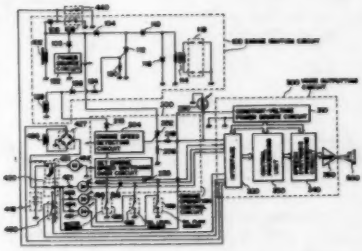
(5) a tone decoder and audio speaker in circuit to said receiver and responsive thereto to generate an audible tone.

4,940,965

VOCAL ALARM FOR OUTBOARD ENGINE

Kazuhiro Umehara, Hamamatsu, Japan, assignor to Suzuki Jidosha Kogyo Kabushiki Kaisha, Shizuoka, Japan

Filed Jul. 21, 1988, Ser. No. 222,183
Claims priority, application Japan, Jul. 31, 1987, 62-193237
Int. Cl.[5] B60Q 1/00
U.S. Cl. 340—460 **2 Claims**



1. A vocal alarm apparatus for an engine, comprising: a plurality of sensors for said engine which each produce a signal upon detecting a respective operational abnormality; and voice synthesizing means coupled to said sensors for producing in response to each said signal a respective synthesized vocal statement; wherein said voice synthesizing means includes prioritization means for checking said sensors in a predetermined sequence for the presence of a signal therefrom, for responding to detection of the presence of a signal from a first

of said sensors by causing said voice synthesizing means to produce the vocal statement corresponding to said first sensor and for then resuming said checking of said sensors according to said predetermined sequence, for responding to detection of the presence of a signal from a second of said sensors by causing said voice synthesizing means to produce the vocal statement corresponding to said second sensor and for then resuming said checking of said sensors according to said predetermined sequence, and for responding to detection of the presence of a signal from a third of said sensors by causing said voice synthesizing means to repeatedly successively produce the vocal statement corresponding to said third sensor until said signal from said third sensor terminates and for thereafter resuming said checking of said sensors according to said predetermined sequence; wherein said prioritization means responds to detection of the presence of a signal from a fourth of said sensors by causing said voice synthesizing means to produce the vocal statement corresponding to said fourth sensor and by then resuming said checking of said sensors according to said predetermined sequence; wherein said predetermined sequence of checking said sensors includes a check for the presence of a signal from said third sensor immediately after the production by said voice synthesizing means of the vocal statement corresponding to each said sensor other than said third sensor; wherein said first sensor produces a signal in response to detection of a condition in which an oil level in the engine is below a predetermined level; wherein said third sensor produces a signal in response to detection of a condition in which the engine speed is being forcibly limited; wherein said fourth sensor produces a signal in response to detection of a condition in which a flow rate of the oil in the engine is below a predetermined rate; and wherein said predetermined sequence includes: a first subsequence in which, in the absence of a signal from any said sensor, said prioritization means successively cyclically checks in order said first sensor, said second sensor, said fourth sensor and said third sensor; a second subsequence in which, following detection of the presence of a signal from said first sensor and the production of the corresponding vocal statement, said prioritization means successively checks in order said third sensor, said second sensor and said fourth sensor, and then resumes said first subsequence with said check therein of said first sensor; a third subsequence in which, following detection by said prioritization means of a signal from said second of said sensors and the production of the corresponding vocal statement, said prioritization means successively checks in order said third sensor, said fourth sensor and said first sensor, and then resumes said first subsequence with said check therein of said second sensor; and a fourth subsequence in which, following detection by said prioritization means of a signal from said fourth sensor and the production of the corresponding vocal statement, said prioritization means successively checks in order said third sensor, said second sensor and said first sensor, and then resumes said first subsequence with said check therein of said fourth sensor.

4,940,966

ARTICLE DETECTION AND/OR RECOGNITION USING MAGNETIC DEVICES

Robert M. Pettigrew; Stephen H. Chambers; Dafydd G. Davies, all of Cambridge, and Michael D. Crossfield, Brackley, all of England, assignors to Scientific Generics Limited, Cambridge, United Kingdom

PCT No. PCT/GB88/00447, § 371 Date Apr. 10, 1989, § 102(e) Date Apr. 10, 1989, PCT Pub. No. WO88/09979, PCT Pub. Date Dec. 15, 1988

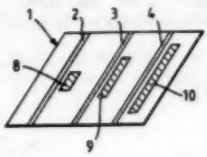
PCT Filed Jun. 8, 1988, Ser. No. 317,455

Claims priority, application United Kingdom, Jun. 8, 1987, 8713353

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—551 **6 Claims**

1. A method of recognising and/or detecting an article at a given point in the course of its movement from a first location to a second location, which comprises securing to said article while it is at said first location a magnetic device which comprises a plurality of magnetic elements in a predetermined association (e.g. with predetermine numbers of magnetic elements and with predetermined spacings between said elements), at least one of said magnetic elements being a soft magnetic material with low coercivity, high intrinsic permeability and low or zero magnetostriction, and at least one other of said magnetic elements being a semi-hard magnetic material; subjecting the article carrying said magnetic device to a predetermined interrogating magnetic field at said given point and observing the interaction between the interrogating field and the magnetic device carried by the article; deducing from said observed interaction the nature of the article; and allowing the article to travel from said given point to said second location; said first location being a point of access to an underground pipe system and said given point being a site where said pipe system itself is accessible but where the contents of said pipe system are inaccessible.



4,940,967

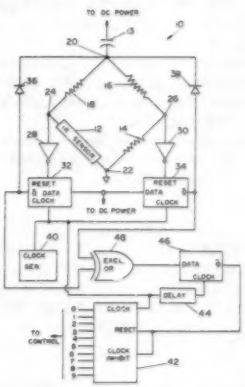
BALANCED DIGITAL INFRARED DETECTOR CIRCUIT

Edgar M. Smith, Millersville, Pa., assignor to Burle Technologies, Inc., Wilmington, Del.

Filed Aug. 31, 1989, Ser. No. 401,043

Int. Cl.[5] G08B *13/18*

U.S. Cl. 340—567 **2 Claims**



1. A digital control circuit which initiates an output signal which is synchronized with a clock pulse when infrared radiation to which a sensor is exposed varies from a prescribed level, comprising:

an infrared sensor with first and second terminals, the effective resistance of which changes with radiation to which it is exposed, the second terminal being interconnected with a circuit return;

a first resistor one terminal of which is connected to the first terminal of the infrared sensor;

a capacitor one terminal of which is connected to a second terminal of the first resistor with the second terminal of the capacitor connected to a DC power supply;

a second resistor, one terminal of which is connected to the junction of the capacitor and the first resistor:

a third resistor one terminal of which is connected to the

second terminal of the second resistor, the second terminal of the third resistor being interconnected with a circuit return, the ratio of the resistance values of the second resistor to the third resistor, being the same ratio as the resistance value of the first resistor to the effective resistance value of the infrared sensor when the infrared sensor is exposed to said prescribed level of infrared radiation;

a first voltage-sensitive switch and inverter, the input of which is connected to the junction of the infrared sensor and the first resistor;

a first digital logic circuit, the reset terminal of which is connected to the output of the first voltage sensitive switch and inverter and with its data terminal connected to the DC power supply;

a first diode with its positive terminal connected to the Q bar output of the first digital logic circuit and its negative terminal connected to the junction of the capacitor and the first resistor;

a second voltage sensitive switch and inverter, the input of which is connected to the junction of the second resistor and the third resistor;

a second digital logic circuit, the reset terminal of which is connected to the output of the second voltage sensitive switch and inverter and with its data terminal connected to the DC power supply;

a second diode with its positive terminal connected to the Q bar output of the second digital logic circuit and its negative terminal connected to the junction of the capacitor and the first resistor;

a clock generator, the output of which is connected to the clock input terminals of the first and second digital logic circuits;

an exclusive OR gate the first input of which is connected to the Q bar output of the first digital logic circuit and the second input of which is connected to the Q bar output of the second digital logic circuit;

a time delay the input of which is connected to the clock generator output; and

a third digital logic circuit, the data input of which is connected to the output of the exclusive OR gate, the clock input of which is connected to the output of the time delay, and the output of which thereby changes its status when the radiation level to which the infrared sensor is exposed varies from the prescribed level.

4,940,968

ANTI-THEFT TAG WITH CONICAL COIL

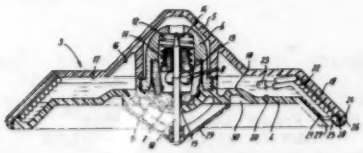
Cornelis S. A. De Nood, Harderwijk, Netherlands, assignor to ID Systems International B.V., Zwolle, Netherlands

Filed Feb. 14, 1989, Ser. No. 311,123

Claims priority, application Netherlands, Feb. 15, 1988, 8800367

Int. Cl.[5] G08B *13/24*

U.S. Cl. 340—572 **6 Claims**



1. Anti-theft tag, comprising dishes which are fixed to each other, and one of which is provided with a feed-through hole for feeding through a pin with a head, said dishes having faces bounding an internal space in which an unlockable lock for locking the fed-through pin and a circuit made up of a coil and a capacitor is accommodated, in which the coil of the circuit is conical and the base of the cone runs substantially parallel to the faces of the dishes.

4,940,969

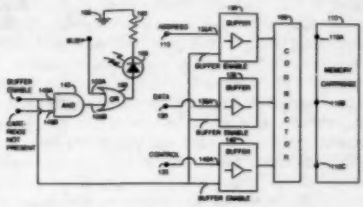
APPARATUS AND METHOD FOR INDICATING WHEN IT IS SAFE AND UNSAFE TO INSERT A MEMORY CARTRIDGE INTO OR REMOVE A MEMORY CARTRIDGE FROM A MEMORY CARTRIDGE RECEIVING DEVICE

Danny R. Taylor, Groton, N.Y., assignor to Databook, Inc., Ithaca, N.Y.

Filed May 22, 1989, Ser. No. 354,473

Int. Cl.[5] G08B *21/00*

U.S. Cl. 340—653 **14 Claims**



8. A method of indicating to a user when it is unsafe to insert a memory cartridge into or remove a memory cartridge from a memory cartridge receiving device, said receiving device being adapted for use in conjunction with at least one buffer which buffers information signals to be supplied to said memory cartridge, said method comprising the steps of:

providing an indicator perceivable by said user;

causing said indicator to assume a first state to indicate to said user that it is unsafe to insert said cartridge into or remove said cartridge from said receiving device when at either of the two following conditions occurs:

(1) an attempt is being made to access said memory cartridge,

(2) said at least one buffer is enabled at the same time said memory cartridge is not present in said receiving device.

4,940,970

CRT DISPLAY DEVICE WITH A PICTURE-SHIFTING CIRCUIT

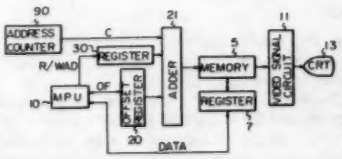
Kiminori Fujisaku, Inagi, Japan, assignor to Fujitsu Limited, Kawasaki, Japan

Continuation of Ser. No. 220,437, Jul. 13, 1988, abandoned, which is a continuation of Ser. No. 20,199, Feb. 27, 1987, abandoned, which is a continuation of Ser. No. 393,532, Jun. 30, 1982, abandoned. This application May 2, 1989, Ser. No. 346,308

Claims priority, application Japan, Jun. 30, 1981, 56-100508

Int. Cl.[5] G09G *1/16*

U.S. Cl. 340—726 **6 Claims**



1. A CRT display device with a picture shifting circuit, comprising:

a memory, having memory addresses, for storing data therein;

a CRT display panel, operatively connected to said memory, for displaying pictures corresponding to data stored in said memory;

a processor unit, operatively connected to said memory, for generating writing addresses to write data from said pro-

cessor unit into said memory and for generating reading addresses to read data from said memory to said processor unit;

storing means operatively connected to said processor unit for storing an offset address;

an address counter, for generating count values specifying a part of the address space of said memory, cyclically and sequentially; and

a calculating circuit, operatively connected to said processor unit, said storing means, said address counter, and said memory, for receiving the writing and reading addresses from said processor unit, the offset address from said storing means, and the count values from said address counter and responsive to said writing and reading addresses generated by said processor unit, said offset address stored in said storing means and said count values generated by said address counter and performing a logical operation with respect to the offset address and one of the writing and reading addresses, for supplying real addresses obtained through said logical operation during a display operation for accessing said memory in accordance with the count values and said offset address, and for supplying real addresses obtained through said logical operation for accessing said memory during one of a read and write operation in accordance with said one of said writing addresses and reading addresses from said processor unit and said offset address.

4,940,971

BIT MAP DISPLAY APPARATUS FOR PERFORMING AN INTERRUPTION DISPLAY AMONG PLANES AT HIGH SPEED

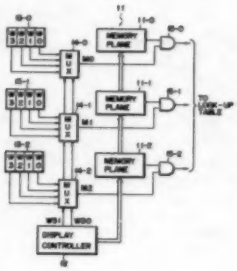
Kouki Hasebe, Fuchu, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 30, 1988, Ser. No. 238,222

Claims priority, application Japan, Aug. 31, 1987, 62-216658

Int. Cl.[5] G09G 5/14

U.S. Cl. 340—721 11 Claims



1. A bit map display apparatus comprising:

a bit map memory having a plurality of memory planes storing image data;

display control means for setting at least one hardware window, and for outputting a window number indicating a display window in accordance with a display scan;

window control data memory means, corresponding to each of the memory planes, for storing data for designating a display enable/disable state for each hardware window;

selection means, corresponding to each of the memory planes, for selecting window display control data output from a corresponding one of the window control data memory means as mask data in accordance with the window number; and

control means, coupled to each of the memory planes, for controlling outputting of data read out from a corresponding one of the memory planes in accordance with the mask data selected by said corresponding selection means.

4,940,972

METHOD OF REPRESENTING A PERSPECTIVE IMAGE OF A TERRAIN AND A SYSTEM FOR IMPLEMENTING SAME

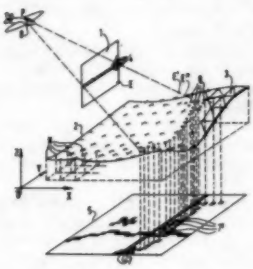
Carine Mouchot, Conflans Ste Honorine, and Gérard Frappier, Paris, both of France, assignors to Societe d'Applications Generales d'Electricite et de Mecanique (S A G E M), Paris Cedex, France

Filed Feb. 10, 1988, Ser. No. 154,576

Claims priority, application France, Feb. 10, 1987, 87 01607

Int. Cl.[5] G09G 1/14

U.S. Cl. 340—747 11 Claims



1. A method of representing, on a display device screen (1) and in perspective from a given point (P) of observation, the image of a terrain (2) and a sky, said terrain being known by the coordinates of the nodes (N) of a given mesh network, in which a surface (3) passing through these nodes (N) is determined by interpolation, an assembly of points (Q) on this surface is determined and the pixels (4) of the image to be represented, which are associated with this assembly of points (Q), are illuminated so as to display the image on the display device screen (1), characterized in that a planimetric map (5) or photograph of the terrain (2) is defined with color informations, the map or photograph is digitized so as to obtain map pixels (7,7') of given colors, the points (Q) of said assembly of points being defined so that each point (Q) is associated with a respective pixel (4) of the image, and furthermore, with each of these points (Q), and with each of the corresponding image pixels (4), a map pixel (7') is associated and each image pixel (4) is illuminated in the color of the associated map pixel (7').

4,940,973

METHOD AND APPARATUS FOR DISPLAYING GRAPHIC AND ALPHANUMERIC DATA

Beatriz E. Katz, Buenos Aires, Argentina, assignor to Alternative Energy Research Center Inc., Panama

Filed Mar. 23, 1988, Ser. No. 172,282

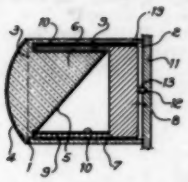
Claims priority, application European Pat. Off., Apr. 1, 1987, 87104786.6

Int. Cl.[5] G09G 3/34

U.S. Cl. 340—764 24 Claims

1. A method for displaying data utilizing a matrix panel of pixels and an outside light source, comprising: drawing light from the outside through a transparent surface on said pixels; deflecting said light by a radiation deflector to hit a reflecting surface corresponding to one of at least two coloured areas belonging to a movable element; deflecting said light reflected

from said reflecting surface to the outside back through said transparent surface; said movable element being shiftable such



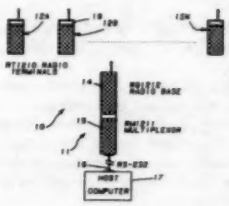
that said light deflected by said radiation deflector strikes a selected one of said coloured areas.

4,940,974

MULTITERMINAL COMMUNICATION SYSTEM AND METHOD

Marvin L. Sojka, Cedar Rapids, Iowa, assignor to Norand Corporation, Cedar Rapids, Iowa

Filed Nov. 1, 1988, Ser. No. 265,842
Int. Cl.[5] H04Q *9/00*
U.S. Cl. 340—825.080 **9 Claims**



1. A method of effecting communication between a primary transceiver means and a group of mobile secondary transceiver means having respective distinctive identification means, with communication link means for affording communication therebetween, said method comprising:

(a) operating said primary transceiver means to transmit a group polling message via said communication link means, specifying a series of response time slots in which the secondary transceiver means may respond,

(b) operating the secondary transceiver means which receive said group polling message and which have a coded data message to transmit to said primary transceiver means

(b1) to randomly select one of the series of response time slots and

(b2) in the respective randomly selected response time slots, to send respective response messages which contain the respective identification means such that the primary transceiver means may identify respective secondary transceiver means of the group which have responded to the group polling message,

(c) operating the primary transceiver means to time the expiration of the series of response time slots defining a response time interval and after expiration of such response time interval, to initiate communication via said communication link means with a particular one of said secondary transceiver means which has responded to said group polling message for receiving a coded data message therefrom,

(d) performing steps (a) a multiplicity of times, and operating said primary transceiver means to change the number of response time slots which are specified in a group polling message according to step (a) in accordance with the number of times a collision occurs wherein plural secondary transceiver means send respective response messages according to step (b2) in the same response time slot, and

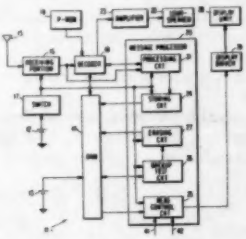
(e) operating said primary transceiver means subsequent to the issuance of a group polling message according to step (a) specifying a changed number of response time slots to observe a different response time interval corresponding to the expiration of the changed number of response time slots before initiating further communications according to step (c) via said communication link means.

4,940,975

RADIO PAGER RECEIVER CAPABLE OF READILY CHECKING WHETHER OR NOT MEMORY BACKUP IS CORRECT

Motoki Ide, and Toshifumi Sato, both of Tokyo, Japan, assignors to NEC Corporation, Tokyo, Japan

Filed Feb. 29, 1988, Ser. No. 161,815
Claims priority, application Japan, Feb. 27, 1987, 62-45741
Int. Cl.[5] G08B *5/22*
U.S. Cl. 340—825.44 **5 Claims**



1. In a radio pager receiver for receiving message signals carrying messages and destined to said pager receiver, said pager receiver comprising a memory activated by main electric power, backed up by backup electric power, and having a message area and an administration data area, and a message processor including processing means activated by said main electric power for processing said message signals into the respective messages and a plurality of administration data for use in administrating said messages and storing means activated by said main electric power for storing said messages in said message area and said plurality of administration data in said administration data area in correspondence to the respective messages, the improvement wherein:

said processing means is for processing said message signals so that a logical relationship is established between said plurality of administration data;

said message processor comprising,

judging means coupled to said administration data area and activated by said main electric power for judging whether or not said logical relationship is correctly kept in said administration data area when said memory, said processing means, and said storing means are activated after once deactivated, said judging means thereby producing a result signal representative of a result of judgment.

4,940,976

AUTOMATED REMOTE WATER METER READOUT SYSTEM

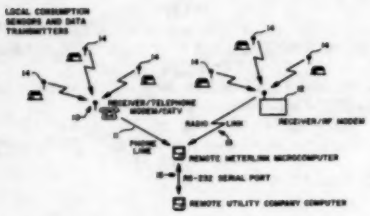
Constantine S. Gastouniotis; Nuno Bandeira, and Kitchener C. Wilson, all of Santa Barbara, Calif., assignors to Utilicom Inc., Santa Barbara, Calif.

Filed Feb. 5, 1988, Ser. No. 152,960
Int. Cl.[5] G01R *11/00*; G01F *1/075*
U.S. Cl. 340—870.02 **33 Claims**

1. In a meter measuring consumption of an item and having

a case with a rotating magnet therein producing a magnetic field moving at a rate proportional to the consumption of the item, the improvement for remotely reading data from outside of the meter without physically invading or modifying the meter comprising:

(a) sensor means disposed outside of the case for sensing a portion of the magnetic field passing through the case and for providing an electrical signal proportional to the rate of movement of the magnetic field;



(b) consumption calculation means connected to receive said electrical signal for producing a binary count of the consumption of the item;

(c) transmitter means for wirelessly transmitting said binary count; and,

(d) receiver means for receiving said wirelessly transmitted binary count and for transmitting said received binary count to a central site which uses the data.

4,940,977

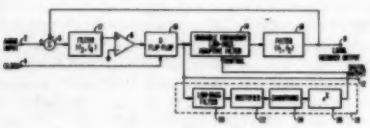
ADAPTIVE-FILTER SINGLE-BIT DIGITAL ENCODER AND DECODER AND ADAPTATION CONTROL CIRCUIT RESPONSIVE TO BIT-STREAM LOADING

Douglas E. Mandell, Menlo Park, Calif., assignor to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Division of Ser. No. 101,369, Sep. 25, 1987, Pat. No. 4,829,299. This application Apr. 8, 1988, Ser. No. 179,955

Int. Cl.[5] H03M *3/02*

U.S. Cl. 341—143 **5 Claims**



1. A control signal generator responsive to an encoded digital bit stream for generating an adaptation control signal for use in an adaptive single-bit digital encoder or decoder, comprising:

means for removing the clock sampling signal component from said digital bit stream to provide an analog signal continuously representative of the amount of information carried by in said digital bit stream,

means for rectifying said analog signal derived from the digital bit stream,

means for smoothing said rectified signal.

4,940,978

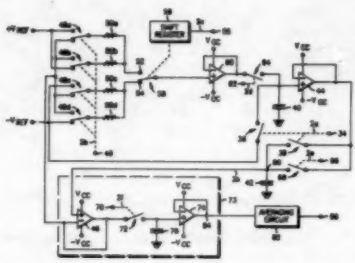
STEPWISE ADJUSTED DIGITAL TO ANALOG CONVERTER HAVING SELF CORRECTION

Victor G. Mycynek, Des Plaines, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed May 23, 1988, Ser. No. 197,737

Int. Cl.[5] H03K *13/02*

U.S. Cl. 341—150 **11 Claims**



1. A digital to analog converter comprising:

means for receiving an input signal made up of digital words in serial form, the least significant bit of each word being received first;

switching means controlled by said input signal;

first supply means for supplying a first reference voltage;

a terminal point;

a first resistor network having a first end coupled to said first supply means, the second end coupled to said terminal point and having the midpoint thereof coupled to a first input of said switching means, the halves of said first netword consisting of essentially equal-valued resistance;

second supply means for supplying a second reference voltage;

a second resistor network having a first end coupled to said second supply means, the second end coupled to said terminal point and having the midpoint thereof coupled to a second input of said switching means, the halves of said second netword consisting of essentially equal-valued resistances; and

storage means coupled to said terminal point and coupled to the output of said switching means for receiving, in response to each received bit, a voltage which is one-half the difference between the respective reference voltage and the voltage on said terminal point.

4,940,979

COMBINED RATE/WIDTH MODULATION ARRANGEMENT

Thomas K. Bohley; Grosvenor H. Garnett, both of Colorado Springs; Christopher Koerner, Longmont, and Charles E. Moore, Loveland, all of Colo., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 26, 1988, Ser. No. 186,430

Int. Cl.[5] H03M *1/82*

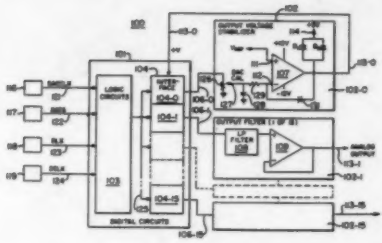
U.S. Cl. 341—152 **35 Claims**

1. Apparatus for generating a rate/width modulated pulse signal on an output in response to the reception of n data bits on an input, said apparatus comprising;

means responsive to the receipt by said input of m bits of said n data bits, where m and n are integers and where m is less than n, for generating a rate modulated output signal having a number of pulses determined by the binary value of said m bits,

means responsive to the receipt by said input of the additional ones of said n bits beyond said m bits for generating a width modulated output pulse signal, and

means for combining said rate modulated output signal and said width modulated output pulse signal to produce said



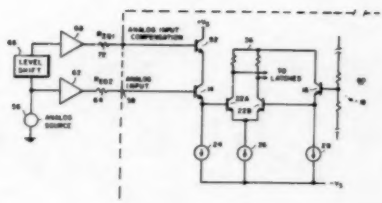
rate/width modulated output signal having a variable number of pulses which increase in width under control of the binary value of said additional bits.

4,940,980

INPUT STAGE FOR FLASH A/D CONVERTER

Thomas E. Tice, Greensboro, N.C., assignor to Analog Devices, Inc., Norwood, Mass.

Filed May 5, 1989, Ser. No. 348,050
Int. Cl.[5] H03M *1/36, 1/06*
U.S. Cl. 341—159 **5 Claims**



4. A flash analog-to-digital converter comprising:

a. a plurality of input stages connected in parallel to an input node for receiving an analog input voltage;

b. means for supplying the analog input voltage, including an analog signal source, a first buffer amplifier connected to receive the output of the analog signal source, and a first resistance connected between the output of the buffer amplifier and the input node;

c. a like plurality of comparator stages, each input stage driving a corresponding one of the comparator stages;

d. each input stage comprising an emitter-follower transistor having a base electrode connected to the input node and an emitter electrode connected to drive the corresponding comparator stage;

e. offset means connected to the analog source to supply a voltage offset from the output of the analog source by a constant value; and

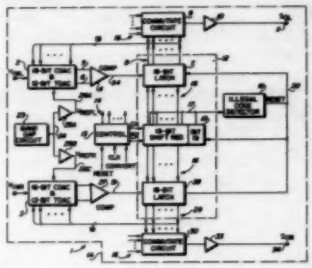
f. said offset means being connected operatively to drive the collector electrodes of said emitter-follower transistors.

4,940,981

DUAL ANALOG-TO-DIGITAL CONVERTER WITH SINGLE SUCCESSIVE APPROXIMATION REGISTER

Jimmy R. Naylor; Rodney T. Burt, and Tony D. Miller, all of Tucson, Ariz., assignors to Burr-Brown Corporation, Tucson, Ariz.

Filed Feb. 8, 1989, Ser. No. 308,150
Int. Cl.[5] H03M *1/44*
U.S. Cl. 341—161 **13 Claims**



1. A dual channel successive approximation analog-to-digital converter chip for converting first and second analog input signals to first and second digital numbers, respectively, comprising in combination:

(a) a semiconductor chip;

(b) a first N bit CDAC on the chip including N digital input conductors, a first analog output conductor, and means for combining the first analog input signal with an analog output signal produced by the first N bit CDAC to produce a first combined signal on the first analog output conductor;

(c) a second N bit CDAC on the chip including N digital input conductors, a second analog output conductor, and means for combining the second analog input signal with an analog output signal produced by the second bit CDAC to produce a second combined analog signal on the second analog output conductor;

(d) a first comparator on the chip having a first input conductor coupled to the first analog output conductor, and a second input conductor receiving a first reference voltage;

(e) a second comparator on the chip having a first input conductor coupled to the second analog output conductor, and a second input conductor receiving a second reference voltage;

(f) a successive approximation register on the chip including:

i. a shift register including N bits each having an output conductor,

ii. first means coupled to an output conductor of the first comparator and the output conductors of the N bits of the shift register for generating a first sequence of successive N bit approximation numbers and sequentially applying them to the N digital input conductors of the first N bit CDAC in response to shifting of a logical state through the shift register from an MSB position to an LSB position thereof and in response to a plurality of compare signals produced by the first comparator, respectively,

iii. second means coupled to an output conductor of the second comparator and the output conductor of the N bits of the shift register for generating a second sequence of N successive N bit approximation numbers and sequentially applying them to the N digital input conductors of the second N bit CDAC in response to the shifting of the logical state through the shift register from the MSB position to the LSB position and in response to a plurality of compare signals produced by the second comparator, respectively, the first N bit

CDAC, the shift register, the first means, and the first comparator forming a part of a first analog-to-digital converter, and the second N bit CDAC, the shift register, the second means, and the second comparator forming a part of a second analog-to-digital converter.

4,940,982

HIGH SPEED INTEGRATING ANALOG-TO-DIGITAL CONVERTER

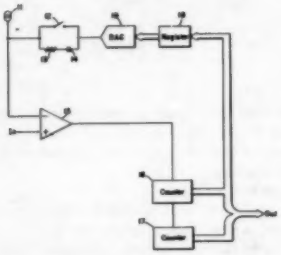
Zdzislaw Gulczynski, P.O. Box 441, Winchester, Mass. 01890

Continuation-in-part of Ser. No. 20,783, Mar. 2, 1987, abandoned. This application Jul. 30, 1988, Ser. No. 251,171

Claims priority, application Fed. Rep. of Germany, Mar. 3, 1986, 3606893

Int. Cl.[5] H03M *1/46, 1/56*

U.S. Cl. 341—169 **18 Claims**



1. Analog-to-digital converter for converting input signal into output code, comprising:

a comparator means for comparing the input signal against a ramp signal;

a plurality of counter means responsive to the comparator means for providing the output code, each counter means having a weight and counting subsequently to the counting of the counter means having a higher weight;

a digital-to-analog converter means for converting the output code into a reference signal;

an integrator means for providing the ramp signal in reference to the reference signal and at a rate corresponding to the weight of the counter means currently counting; and

a switch means for zeroing the integrator means.

4,940,983

A/D CONVERTERS

Roger E. Jones, Cambridge; John A. Phillips, Harlow, and Bruce Dunnett, Cupar, all of Great Britain, assignors to Ste PLC. London, England

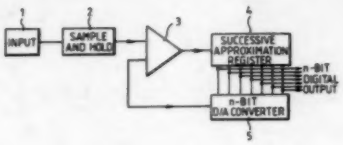
Filed Oct. 21, 1988, Ser. No. 261,242

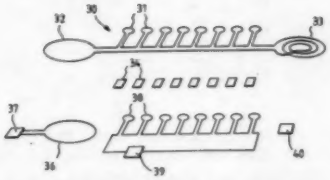
Claims priority, application United Kingdom, Dec. 5, 1987, 8728497; Sep. 22, 1988, 8822360

Int. Cl.[5] H03M *1/38*

U.S. Cl. 341—171 **10 Claims**

1. A successive approximation n-bit analogue to digital converter including an addition/subtraction superconducting loop having a sensing lobe, a magnetic flux concentrating lobe and n further lobes; a non-superconducting drive loop to which an analogue signal to be converted is applied; superconducting loops for storing n flux quanta which are used as reference levels; control circuits for selectively coupling each flux quanta reference level with a respective one of the n further lobes; means for coupling magnetic flux at the drive loop to the sensing lobe whereby the analogue signal in the drive loop is in use sampled and a corresponding magnetic flux linked to the





addition/subtraction superconducting loop; and a magnetometer for detecting the magnetic flux at the concentrating lobe.

4,940,984

TRANSMITTING STATION FOR A NAVIGATION SYSTEM COMPRISING A MAIN TRANSMITTER AND A STAND-BY TRANSMITTER, PARTICULARLY TRANSMITTING STATION FOR THE MLS MICROWAVE LANDING SYSTEM

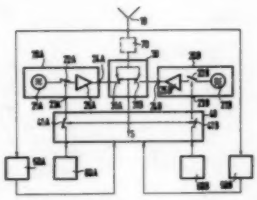
Herbert Kleiber, Ludwigsburg, Fed. Rep. of Germany, assignor to SEL Standard Elektrik Lorenz AG, Stuttgart, Fed. Rep. of Germany

Filed Mar. 21, 1989, Ser. No. 326,621

Claims priority, application Fed. Rep. of Germany, Mar. 29, 1988, 3810628

Int. Cl.[5] G01S *7/40*

U.S. Cl. 342—173 **3 Claims**



1. Transmitting station for a navigation system said transmitting station comprising

a first transmitter having a first power output terminal and a first control input terminal via which power at the first power output terminal can be switched off,

a second transmitter in parallel to and functionally interchangeable with the first transmitter, said second transmitter having a second power output terminal and a second control input terminal via which power at the second power output terminal can be switched off,

a common antenna system having an antenna input terminal coupled to both the first power output terminal and the second power output terminal for transmitting a navigation signal,

a monitoring device which monitors the navigation signal output from the common antenna system and delivers an error message in the event of an error,

controller means coupled to said first and second control inputs and responsive to the error message from the monitoring device for, in the absence of said error message,

causing at times when neither of the transmitters is delivering any such output power the first and second transmitters to alternate with each other in delivering power to the antenna input terminal and, in response to said error message, causing only the transmitter not transmitting at the time the error occurred to constantly deliver power to said antenna input terminal, and

a changeover switch interposed between the antenna system input terminal and said first and second power output terminals, said changeover switch being controlled by the controller means and disconnecting a respective inactive one of the first and second transmitters from the common antenna system,

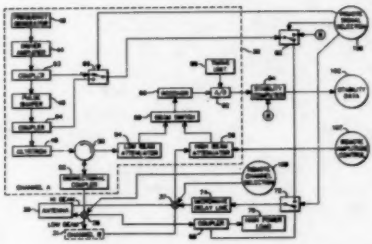
whereby the particular transmitter not connected to the common antenna system is not delivering any output power, thereby eliminating any need for a second antenna system and/or a dummy load to be connected to said particular transmitter.

4,940,985

RADAR STABILITY MEASUREMENT SYSTEM

John W. Taylor, Jr., Baltimore, and Perry A. Sorrell, Severna Park, both of Md., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1988, Ser. No. 266,194
Int. Cl.[5] G01S 7/40
U.S. Cl. 342—174 **20 Claims**



1. A method for measuring stability of a radar system, said method comprising the steps of:

(a) sampling a portion of a pulse to detect input and output power of a Doppler filter in the radar system;

(b) repeating step (a) for a first predetermined number of pulses;

(c) calculating a portion stability indication for the portion of the pulse repeatedly sampled in step (a), said calculating performed to determine clutter residue power at the output of the Doppler filter and the input power of the Doppler filter, detected for the first predetermined number of pulses; and

(d) repeatedly changing the portion of the pulse sampled in step (a) and repeating steps (a)–(c) for each change, to produce a second number of stability indications over an effective pulse width of pulses sampled in step (a).

4,940,986

MILLIMETER WAVE LOCATING

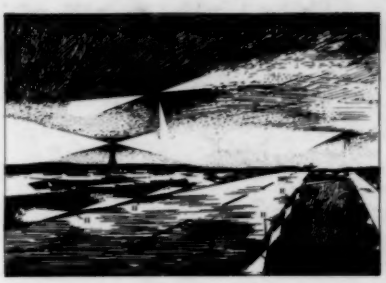
George R. Huguenin, South Deerfield, Mass., assignor to Millitech Corporation, Mass.

Filed Jun. 16, 1986, Ser. No. 874,461
Int. Cl.[5] G01S 1/16, 13/00
U.S. Cl. 342—410 **8 Claims**

1. Area locating apparatus comprising,

millimeter wave source means at an area to be located for radiating millimeter wave energy that penetrates fog and blowing snow,

and millimeter wave camera means remote from said area responsive to said millimeter wave energy for providing a



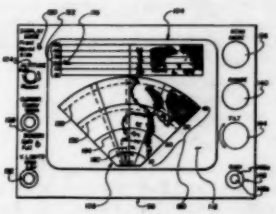
location signal representative of the location of said millimeter wave source means.

4,940,987

AUTOMATIC HORIZONTAL AND VERTICAL SCANNING RADAR

Philip R. Frederick, 632 17th Ave., Salt Lake City, Utah 84103-3709

Filed Jan. 30, 1989, Ser. No. 303,638
Int. Cl.[5] G01S 9/66
U.S. Cl. 342—26 **20 Claims**



1. An automatic horizontal and vertical scanning weather radar system for a transmitting and receiving station comprising

antenna means mounted in the station for receiving reflected radar signals and responsive to a transmit signal for producing and directing outwardly therefrom a radar beam, and responsive both to horizontal drive signals for sweeping the radar beam back and forth horizontally, and to vertical drive signals for moving the radar beam up and down vertically,

means for periodically supplying transmit signals to the antenna means,

receiver means coupled to the antenna means for digitizing reflected radar signals received by the antenna means,

means for storing the digitized signals,

display means responsive to the digitized signals for displaying both a plan view image of weather over a preselected horizontal range represented by reflected radar signals received by the antenna means sweeping back and forth horizontally, and a vertical view image of weather for a preselected height range represented by reflected radar signals received by the antenna means moving up and down vertically, and

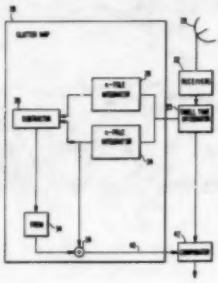
control means for supplying horizontal drive signals and vertical drive signals to the antenna means, and for retrieving digitized signals from the storing means and supplying them to the display means.

4,940,988

TWO PARAMETER CLUTTER MAP

John W. Taylor, Jr., Baltimore, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Nov. 2, 1988, Ser. No. 266,192
Int. Cl.[5] G01S *13/86*
U.S. Cl. 342—93 **23 Claims**



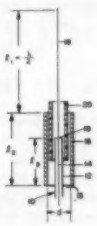
1. A clutter map system, comprising:
antenna means for scanning a target;
receiver means for receiving echoes from said antenna means;
dwell time integration means, for receiving multiple echoes during the time said antenna means scans a given spatial location, accumulating and integrating the echoes and outputting data;
means, including n-pole integration means, n being an integer greater than or equal to one, for receiving the data and simultaneously calculating two variables having different parameters; and
means for storing a predetermined boost factor for computing a detection threshold.

4,940,989

APPARATUS AND METHOD FOR MATCHING RADIATOR AND FEEDLINE IMPEDANCES AND FOR ISOLATING THE RADIATOR FROM THE FEEDLINE

Richard A. Austin, Powder House Rd., R.D. #1, Sandown, N.H. 03873

Continuation-in-part of Ser. No. 856,236, Apr. 28, 1986. This application Dec. 12, 1988, Ser. No. 282,677
Int. Cl.[5] H01Q *9/40*
U.S. Cl. 343—749 **12 Claims**



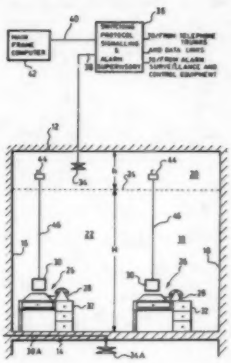
1. A mechanism for matching the impedance of an antenna radiator to the impedance of its feed line and for isolating the radiator from the feed line comprising:
a transmission feed line having inner and outer conductors,
a radiator feedpoint located at the upper terminus of the outer conductor,
the inner conductor having an extension extending beyond the feedpoint and defining a complete ½ wavelength radiator,
a cavity choke having an opened end and a closed end and circumscribing and in spaced relation to the feed line,
the closed end being electrically connected to the outer conductor of the feed line,
the opened end surrounding the feedpoint,
a dielectric means positionable between the choke and outer conductor for tuning by resonating the cavity of the choke and forming a high impedance at the cavity's opened end while simultaneously attaining feedpoint impedance matching.

4,940,990

INTRABUILDING WIRELESS COMMUNICATION SYSTEM

Mostafa Z. Kharadly, Vancouver, and Fredrick W. C. Siu, Burnaby, both of Canada, assignors to University of British Columbia

Filed Jan. 19, 1989, Ser. No. 298,753
Int. Cl.[5] H01Q *21/00, 13/00*
U.S. Cl. 343—773 **8 Claims**



1. An intrabuilding wireless multi-access communication system for use within a work space, comprising an omni-directional antenna system transmitting coded signals and supplying radiation substantially only within a first zone occupying only a portion of said work space, a second zone substantially free of radiation and occupying substantially the remainder of said work space, said first zone being positioned adjacent to an upper boundary of said work space, work stations within said second zone, each of said work stations having a subscriber antenna system connected thereto, each said subscriber antenna system having a subscriber antenna positioned within said first zone and oriented relative to said omni-directional antenna to receive signals from said omni-directional antenna and transmit signals to said omni-directional antenna.

4,940,991

DISCONTINUOUS MOBILE ANTENNA

Jack W. Sheriff, 2167 Calle Guaymas, La Jolla, Calif. 92037

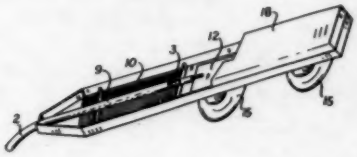
Continuation-in-part of Ser. No. 179,788, Apr. 11, 1988, abandoned, and a continuation-in-part of Ser. No. 211,893, Jun. 27, 1988. This application Jan. 9, 1989, Ser. No. 294,186
Int. Cl.[5] H01Q *9/28*
U.S. Cl. 343—795 **11 Claims**

1. An antenna connectable to a radio communication device which consists of:
a first conductive panel-shaped, generally oblong element;
a second conductive panel-shaped, generally oblong element having a different geometry;

said elements being aligned in a same plane along their largest axes and defining a gap between two respective adjacent edges of said elements;

a coaxial cable, connectable at a distal end to the communication device and having a proximal end section running parallel to said largest axes along said first element and terminating within said gap;

a first conductor in the center of said cable being connected at said proximal end to the edge of the second element adjacent to the first element;



a second conductor of said cable forming a sleeve around said first conductor and being connected at said proximal end to the edge of the first element adjacent to the second element;

said first element having a discontinuous construction;

an oblong container completely enclosing said conductive elements and said end section of the cable, said container being made of a dielectric material having a dielectric strength greater than air.

4,940,992

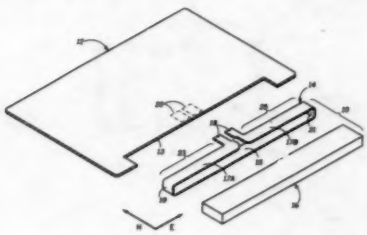
BALANCED LOW PROFILE HYBRID ANTENNA

Tuan K. Nguyen, 22699 SW 53rd Ave., Boca Raton, Fla. 33433, and Quirino Balzano, 1120 NW 77th Ave., Plantation, Fla. 33322

Continuation of Ser. No. 179,707, Apr. 11, 1988, abandoned. This application Aug. 18, 1989, Ser. No. 395,174

Int. Cl.[5] H01Q *9/26*

U.S. Cl. 343—803 **11 Claims**



1. An antenna for a thin portable communications receiver, comprising:

a conductor formed into single turn rectangular loop having a first set of two parallel opposed sides up to one-quarter wavelength in length at the operating frequency and a second set of two parallel opposed sides shorter than said first set of sides, said loop terminating in connection tabs, located symmetrically about the midpoint of one of said first set of sides, for connection to the receiver; and

a dielectric core interposed within said loop and substantially filling said loop, with said dielectric core further forming a half-wave electric dipole symmetrical about said connection tabs at the operating frequency.

4,940,993

IMAGE RECORDING APPARATUS

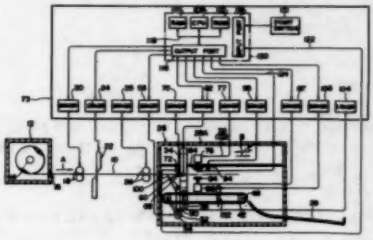
Yoshinitsu Sato, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Apr. 18, 1989, Ser. No. 339,839

Claims priority, application Japan, Apr. 19, 1988, 63-96135; Apr. 19, 1988, 63-96136; Apr. 19, 1988, 63-96137

Int. Cl.[5] G01D *15/10*

U.S. Cl. 346—76 PH **19 Claims**



1. An image recording apparatus for recording an image on a heat-sensitive recording material composed of a transparent carrier and transparent heat-sensitive coupler layers formed on the opposite surfaces of said transparent carrier, respectively, and capable of producing colors each having a different hue, a plurality of transparent heat-sensitive coupler layers being deposited on at least one of said opposite surfaces, comprising:

feeding means for feeding said heat-sensitive recording material rectilinearlily;

a recording head means for developing by heating, the colors of said respective transparent heat-sensitive coupler layers of said heat-sensitive recording material fed by said feeding means;

light fixing means for fixing, by irradiation with light rays, the outermost transparent heat-sensitive coupler layer that produced its color from among said plurality of transparent heat-sensitive coupler layers; and

light fixing means for fixing, by irradiation with light rays, the outermost transparent heat-sensitive coupler layer that produced its color from among said plurality of transparent heat-sensitive coupler layers; and

controller means for coordinating the operation of said feeding means, reading head means and light fixing means in order to permit recording of multi-color images on said material.

4,940,994

THERMAL PRINTER

Gerhard Habelt, and Franz Mucha, both of Vienna, Austria, assignors to U.S. Philips Corporation

Filed May 1, 1989, Ser. No. 345,393

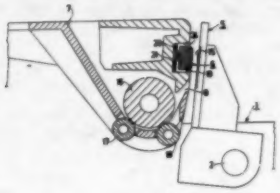
Claims priority, application Austria, May 3, 1988, 1147/88

Int. Cl.[5] G01D *15/10*; B41J *11/08*

U.S. Cl. 346—76 PH **3 Claims**

1. A thermal printer comprising a thermal print head displaceable in the line direction of the printer and a print bar which serves as an abutment for the print head, the print bar extending in the line direction and being located opposite to the print head, said print bar being arranged so that it can be pivoted about an axis parallel to the line direction and comprising a supporting part and a ruler-shaped mounting part, one of the major surfaces of said supporting part constituting said abutment, said supporting part consisting of an elastic material;

characterized in that said supporting part of the print bar is connected to said ruler-shaped mounting part thereof by means



of at least one resilient elongated hinge part, said hinge part projecting centrally from the supporting and mounting parts.

4,940,995

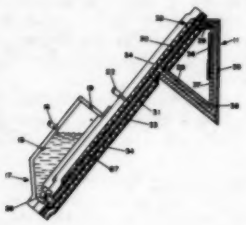
REMOVAL OF DISSOLVED GAS FROM INK IN AN INK JET SYSTEM

Nathan P. Hine, East Thetford, Vt., and Robert L. Wells, Jr., Hanover, N.H., assignors to Spectra, Inc., Hanover, N.H.

Filed Nov. 18, 1988, Ser. No. 273,883

Int. Cl.[5] G01D *15/14*; B01D *19/00*

U.S. Cl. 346—140 R **10 Claims**



1. A device for removing dissolved gas from ink containing dissolved gas and low-molecular-weight components in an ink jet system while preventing formation of scum comprising a gas-permeable, ink-impermeable fluorine-containing membrane which is permeable to dissolved gas in adjacent ink layer but impermeable to low-molecular-weight components of the ink which tend to form scum on the membrane, means for applying ink containing dissolved gas and low-molecular weight components to one side of the fluorine-containing membrane, and means for applying a reduced gas pressure to the other side of the membrane to cause gas to dissolved in ink to be extracted from the ink through the fluorine-containing membrane while preventing passage of low-molecular-weight ink components.

4,940,996

DROP-ON-DEMAND PRINTHEAD

Anthony D. Paton, The Thatched Cottage, 51 Mills Lane, Longstanton St. Michael, Cambridge; Stephen Temple, 66 Girton Road, Cambridge, CB3 OIN, and Mark R. Shepherd, 116 King James Way, Royston, Hertfordshire, SG8 7EF, all of England

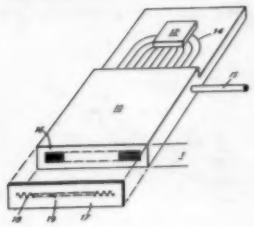
Filed Apr. 28, 1989, Ser. No. 345,600

Claims priority, application United Kingdom, Apr. 29, 1988, 8810241

Int. Cl.[5] G01D *15/18*; B41J *2/04, 2/145*

U.S. Cl. 346—140 R **23 Claims**

1. A drop-on-demand ink drop printhead for selectively printing drops of ink in a print line comprising: a plurality of print modules arranged to form a given number of module layers, said layers being laterally offset from each other by an equal amount, each of said modules comprising at least one group of uniformly laterally spaced ink ejectors, the ejector groups in each of said layers being laterally space from each other by the same amount and arranged with respect to the ejector groups of the other layers such that each segment of



the print line is formed by interleaving drops from vertically overlapping portions of at least two of said ejector groups with a density equal to the product of the drop deposition density of each of said groups and the number of said groups having vertically overlapping portions contributing to the formation of each respective print line segment.

4,940,997

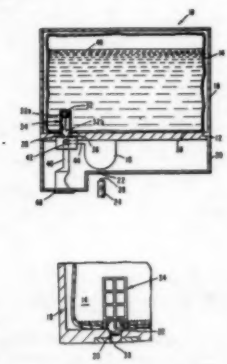
OUT-OF-INK SENSING METHOD

Mindy A. Hamlin, Oceanside, and George Kaplinsky, San Diego, both of Calif., assignors to Hewlett-Packard Company, Palo Alto, Calif.

Filed Aug. 8, 1989, Ser. No. 390,807

Int. Cl.[5] G01D *15/18*; G01F *23/00*

U.S. Cl. 346—140 R **14 Claims**



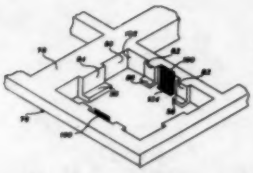
1. In an ink-jet printer having an ink bag, a bladder, a printhead, and a three-way valve which can selectively provide ink from the bag to the bladder, or from the bladder to the printhead, or cut off flow of ink in any direction, the improvement consisting of using a ball check-valve to terminate ink flow from the ink bag to the bladder when ink in the ink bag falls below a predetermined level.

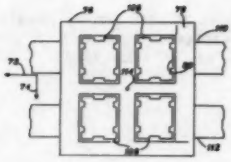
4,940,998

CARRIAGE FOR INK JET PRINTER

Stuart D. Asakawa, San Diego, Calif., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Apr. 4, 1989, Ser. No. 333,364
Int. Cl.[5] B41V *2/05, 2/21*
U.S. Cl. 346—140 R **5 Claims**





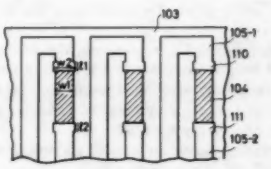
1. A printing unit for an ink jet printer, comprising:
means for supporting four print heads in a rectangular array, wherein the means for supporting includes a support plate having four pockets therein disposed in a rectangular array, each pocket being adapted to receive a removable print head, and wherein each of the four pockets includes at least three stops, two for preventing movement of the received print head in a direction lying in the plane of the rectangular array and the third for preventing movement of the received print head in a direction perpendicular to the plane of the rectangular array.

4,940,999

LIQUID JET RECORDING HEAD

Masami Ikeda, Machida; Makoto Shibata, Hiratsuka; Hiroto Matsuda, Ebina, and Hiroto Takahashi, Hiratsuka, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 873,295, Jun. 9, 1986, abandoned, which is a continuation of Ser. No. 598,975, Apr. 11, 1984, abandoned. This application Jun. 27, 1989, Ser. No. 372,167
Claims priority, application Japan, Apr. 20, 1983, 58-69587
Int. Cl.[5] G01D *15/18*
U.S. Cl. 346—140 R **11 Claims**



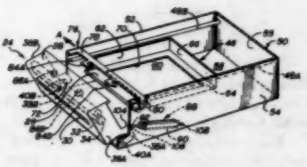
1. A liquid jet recording head comprising:
a liquid discharging portion having an orifice for discharging liquid as a flying liquid droplet and a liquid area communicating with said orifice; and
a electrode-thermal converting element including a heat-generating resistive layer and an electrode electrically connected to said resistive layer to form in said resistive layer a heat generating area in contact with said electrode for generating thermal energy and transferring said thermal energy to liquid in said liquid area to discharge liquid as the flying liquid droplet, wherein said electrode has portions in contact with both ends of said heat generating area and the width of said electrode is increased only in said portions so that the width of said portions of said electrode is greater than the width of said heat-generating area at the portions thereof in contact with said electrode and said electrodes is in electrical contact with a single said heat-generating area and wherein a plurality of said liquid areas are provided and each has a corresponding said heat generating area associated therewith.

4,941,000

DOWN LOADING FILM ACCESS DOOR ASSEMBLY FOR ELECTRONIC IMAGING APPARATUS

Nicholas Cardoos, Jr., Bedford; Stephen Decker, Sudbury; Philip R. Norris, North Reading, and Lawrence Plummer, Needham, all of Mass., assignors to Polaroid Corporation, Cambridge, Mass.

Filed Oct. 13, 1989, Ser. No. 421,082
Int. Cl.[5] G01D *15/00*; G11B *33/02*
U.S. Cl. 346—145 **9 Claims**



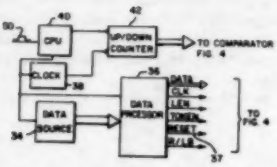
5. In an electronic image recording apparatus of the type comprising a housing and a film cassette receiving carriage disposed for controlled reciprocal sliding translation within said housing, said carriage being open at one end thereof to accommodate sliding receipt therein and/or withdrawal therefrom of a film cassette in substantially the same direction that said carriage translates, the improvement comprising:
a film loading access door assembly;
means for pivotally connecting the lower portion of the film loading access door assembly for movement from an upright closed position blocking receipt and/or withdrawal of the film cassette with respect to said carriage to an extended open position accommodating receipt and/or withdrawal of the film cassette with respect to said carriage;
manually actuable means for latching said film loading access door in said upright closed position;
latching means displaceably mounted for movement between a first position in latching engagement with said carriage so as to inhibit said sliding translation of said carriage and a second position out of latching engagement with said carriage so as not to inhibit said sliding translation of said carriage, said latching means also including means operatively controlled by said film loading access door assembly to move said latching means to its said first position when said film loading access door is moved to its said extended open position and to move said latching means to its said second position when said film loading access door is moved to its said upright closed position.

4,941,001

NON-IMPACT DOT PRINT HEAD WITH RESET

Martin Potucek, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 26, 1989, Ser. No. 385,121
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—154 12 Claims



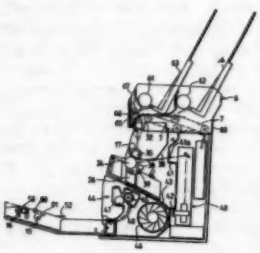
1. A dot printer comprising:
a print head with a plurality of recording elements;
a power supply for driving the recording elements;
a source of logic supply voltage;
a source of data signals;
means for supplying a first reset signal to the print head to place the recording elements in a safe state in the absence of data signals; and
means on the print head for supplying a second reset signal to the print head to place the recording elements in a safe state in the absence of data signals if the logic supply voltage goes below a predetermined value.

4,941,002

PAGE PRINTER

Mitsuaki Maruyama; Hiroshi Niki; Shigeru Sawada; Seiji Mochizuki, and Yasuhiro Gyoutoku, all of Nagano, Japan, assignors to Seiko Epson Corporation, Tokyo, Japan

Filed Aug. 24, 1989, Ser. No. 397,903
Claims priority, application Japan, Aug. 31, 1988, 63-218038; Aug. 31, 1988, 63-218039; Aug. 31, 1988, 63-218040
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—160 8 Claims



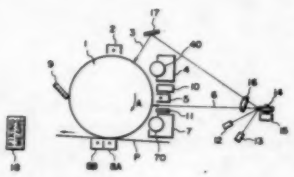
1. A page printer comprising:
a housing including a housing body having an open upper end, an open front side, and a cover pivotally coupled to said housing body;
a gate roller, a developing unit, a photo-sensitive drum unit, a fixing unit, and a sheet discharging roller mounted along the open front side of said housing body;
an optical writing unit mounted in a rear portion of said housing body;
a transferring unit and a sheet guide member mounted on said cover so that said transferring unit and sheet guide member are in confronting relation to said photo-sensitive drum unit when said cover is closed; and
a cut sheet feeder mounted vertically above the open upper end of said housing body so as to be movable relative thereto.

4,941,003

IMAGE FORMING APPARATUS

Atsushi Takeda; Masahiro Itoh, and Hiroaki Tsuchiya, all of Yokohama, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 20, 1988, Ser. No. 260,311
Claims priority, application Japan, Oct. 22, 1987, 62-267524
Int. Cl.[5] G01D 15/00
U.S. Cl. 346—160 21 Claims



1. An image forming apparatus, comprising:
a movable image bearing member;
first charging means for charging said image bearing member;
first latent image forming means for forming a first latent image in accordance with first image information on said image bearing member charged by said first charging means;
first developing means for developing the first latent image;
potential attenuating means for attenuating a potential of said image bearing member after at least said first latent image is developed;
second charging means for charging said image bearing member after at least the first latent image is developed;
second latent image forming means for forming a second latent image in accordance with second image information on an image bearing member charged by said second charging means;
second developing means for developing the second latent image;
image transfer means for transferring the first and second developed images from said image bearing member onto an image receiving material, wherein the first and second developed images are simultaneously transferred onto the same image receiving material;
potential detecting means for detecting a surface potential of said image bearing member; and
control means responsive to an output of said potential detecting means to control at least one of said potential attenuating means and said second charging means to converge to a target level a potential difference between a potential, after being charged by said second charging means, of a portion developed by said first developing means and a potential, after being charged by said second charging means, of a background portion.

4,941,004

PRINTER APPARATUS

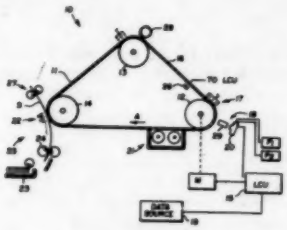
Hieu T. Pham, Webster; Yee S. Ng, Fairport; Kenneth D. Kiefer; Pin S. Tschang, both of Rochester, and Eric K. Zeise, Pittsford, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Continuation of Ser. No. 199,981, May 27, 1988, Pat. No. 4,831,395, which is a continuation of Ser. No. 132,638, Dec. 9, 1987, abandoned, which is a continuation of Ser. No. 33,550, Apr. 1, 1987, abandoned. This application Mar. 8, 1989, Ser. No. 320,733

The portion of the term of this patent subsequent to May 16, 2006, has been disclaimed.

Int. Cl.[5] G01D *15/00*

U.S. Cl. 346—160 **12 Claims**



1. In a printing apparatus for exposing a light sensitive recording medium; a print head including a series of point-like radiation sources arranged in a row for exposing the medium; means for moving the medium relative to the print head; means providing data signals representing data to be printed; logic means responsive to the data signals for determining which of the point-like radiation sources are to be selected for energization; current driver means responsive to the logic means for providing electrical current to the radiation sources selected for energization; the improvement which comprises:

wherein the current driver means includes a current mirror having a master circuit for generating a reference current and a plurality of slave circuits for providing respective driver currents to the radiation sources selected for energization; the master circuit being characterized by a resistor means of the type that at least prior to final adjustment permits for adjustment of driver currents through change of resistance values and wherein the master circuit further includes a variable voltage source for also permitting adjustment of the levels of driver currents.

4,941,005

PHOTOGRAPHIC CAMERA

Nobuyuki Kameyama, Tokyo; Takao Umetsu, Saitama; Tuyoshi Masaoka, Saitama; Haruo Onozaka, Saitama; Muneyoshi Sato, Saitama, and Yukio Okazaki, Saitama, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 14, 1989, Ser. No. 366,182

Claims priority, application Japan, Jun. 14, 1988, 63-146088; Jun. 14, 1988, 63-146398; Oct. 11, 1988, 63-255364

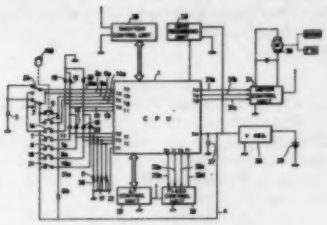
Int. Cl.[5] G03B *3/10, 17/04*

U.S. Cl. 354—195.1 **2 Claims**

1. A photographic camera having a zoom lens as a taking lens which is moved back and forth by means of an electric motor so as to change the focal length of said zoom lens and a lens barrier which covers and protects said zoom lens when said camera is not used, said camera comprising:

a switch adapted to open and close upon opening and closing said barrier; and

means for reading conditions of said switch upon loading a battery into said camera so as to actuate said electric motor in order to retract said zoom lens inside a housing of said camera upon reading a condition of said switch indicating that said lens barrier is closed or to extend said zoom lens to a photographic position upon reading a



condition of said switch indicating that said lens barrier is open.

4,941,006

AUTOMATIC PROCESSOR

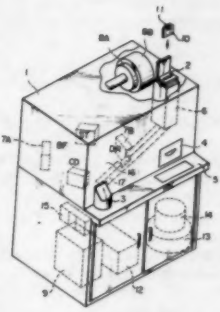
Masayuki Kurematsu; Shigeharu Koboshi; Nobutaka Goto, all of Hino; Masayuki Naoi, and Yasuhiro Fujisawa, both of Yokohama, all of Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 311,520

Claims priority, application Japan, Feb. 19, 1988, 63-36798

Int. Cl.[5] G03D *3/06, 3/08*

U.S. Cl. 354—299 **7 Claims**



1. An automatic developing apparatus for processing disk film housed in a light-shielded cartridge which comprises a pair of plastic sides, said apparatus comprising

(1) means for opening said cartridge and dropping said disk film therefrom by peeling off a lower end of said cartridge while it is vertically supported;

(2) a plurality of processing baths comprising at least two of a color developing bath, a bleach bath, a fixing bath, and a stabilizing bath, and optionally a drying unit, each bath containing a processing solution;

(3) means for supporting horizontally disposed first spindles, each of said first spindles adapted to engage said disk film substantially at the center thereof and being arranged in a closed path passing over said processing baths, whereby said disk film is only partially submerged in said processing solution;

(4) means for moving said first spindles means from bath to bath at a predetermined interval and timing;

(5) means for rotating said disk film around the axis of said first spindles at a predetermined rotation speed during processing;

(6) means for detaching said disk film from said first spindles after the completion of said processing;

(7) means for automatically supplying said processing solutions to said processing baths in predetermined amounts or to predetermined levels in said baths and thereafter automatically starting operation of a heating means, after a main switch of the apparatus is turned on; and

(8) means for draining said processing solutions.

4,941,007

APPARATUS FOR PROCESSING PHOTOGRAPHIC MATERIAL TO BE DEVELOPED

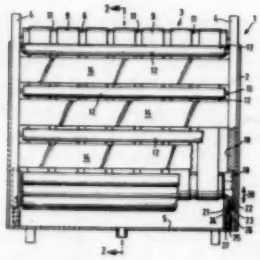
Siegfried Nissler, and Miroslav Radomirevic, both of Leinfelden-Echterdingen, Fed. Rep. of Germany, assignors to Autopan Heimerdinger & Stäbler GmbH & Co., Leinfelden-Echterdingen, Fed. Rep. of Germany

Filed Apr. 24, 1989, Ser. No. 342,955

Claims priority, application Fed. Rep. of Germany, Apr. 23, 1988, 3813771; Dec. 31, 1988, 8816224[U]

Int. Cl.[5] G03D *3/08*

U.S. Cl. 354—320 **11 Claims**



1. An apparatus for processing photographic material to be developed, comprising:

at least one container provided so as to receive a processing liquid;

conveyor means located in said container for conveying the material to be developed through the processing liquid, said conveyor means including two reversing rollers and at least one conveyor belt endlesly revolving around said two reversing rollers;

means for retaining the material to be developed at an outer surface of said at least one conveyor belt, at least one of said two reversing rollers being displaceable in a conveying direction of said at least one conveyor belt; and

at least one spring arranged so that said reversing roller is displaceable and immobilizable against the action of said spring.

4,941,008

PHOTOSENSITIVE MATERIAL PROCESSING APPARATUS

Takashi Nakamura, Minami-ashigara, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed Jun. 16, 1989, Ser. No. 367,088

Claims priority, application Japan, Jun. 17, 1988, 63-150883; Jul. 22, 1988, 63-183777

Int. Cl.[5] G03D *3/02*

U.S. Cl. 354—320 **2 Claims**

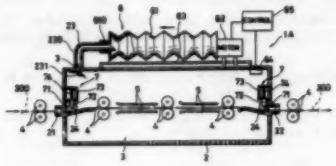
1. A photosensitive material processing apparatus comprising

a procesing tank of the closed type having an inlet slit and an outlet slit for photosensitive material, the tank being filled with processing solution and having no open space present above the surface of the processing solution,

seal means disposed adjacent said inlet slit and/or said outlet slit for providing a fluid-tight seal to the slit, but allowing passage of the photosensitive material,

transfer means for carrying the photosensitive material into the tank through the inlet, along a predetermined path in the tank, and then out of the tank through the outlet, and

supply means for supplying processing solution to the tank wherein said supply means supplies a controlled amount of processing solution to the tank to maintain the solution in the tank at a predetermined pressure,



wherein each of said inlet and said outlet is in the form of a slit having such a small opening that the processing solution may not leak through the slit due to its surface tension.

4,941,009

METHOD FOR SLOW SYNCHRO-FLASH PHOTOGRAPHY

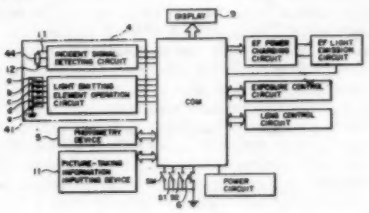
Makoto Yoshida, Hachioji, Japan, assignor to Konica Corporation, Tokyo, Japan

Filed Jun. 26, 1989, Ser. No. 371,093

Claims priority, application Japan, Jul. 7, 1988, 63-167742; Sep. 9, 1988, 63-224455

Int. Cl.[5] G03B *13/36, 15/02*

U.S. Cl. 354—402 **8 Claims**



1. A method for taking a photograph with a camera, the camera having a flash light exposure mode with a predetermined light efficiency, a natural light exposure mode, and an automatic selection mode where the camera can automatically select the flash light or natural exposure mode depending upon photographic conditions, the method comprising the steps of:

determining a plurality of distances between the camera and a plurality of objects occupying a picture area, by wide area distance measurement means;

classifying the objects in the picture area into a plurality of background objects which are at a distance beyond the flash light efficiency of the flash light exposure mode, and at least one foreground object being within the range of the flash light efficiency of the flash light exposure mode;

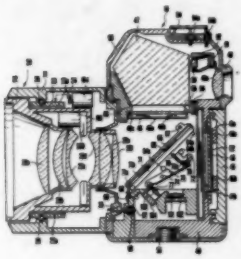
detecting a plurality of luminances of the background and foreground objects with the use of a photometry device; and

activating the camera to photograph the at least one foreground object in the flash light exposure mode and the background objects in the natural light exposure mode to correctly expose all of the objects in the picture area.

4,941,010
CAMERA

Yoshihiko Aihara, and Masayuki Suzuki, both of Kanagawa, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 29, 1989, Ser. No. 415,067
Claims priority, application Japan, Oct. 4, 1988, 63-251460
Int. Cl.[5] G03B 3/00
U.S. Cl. 354—407 21 Claims

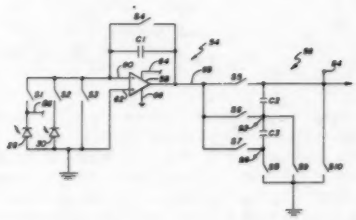


13. A camera having focus detecting means, comprising:
(a) an optical element for splitting an object light beam at a predetermined ratio to a finder optical system and a photographic system;
(b) a second optical element for focus detection movable between a first state in which it lies within a photographic optical path in said photographic system and a second state in which it retracts from said photographic optical path, said second optical element conducting part of a photographing light beam to a focus detecting optical system; and
(c) drive means, responsive to termination of an operation of said focus detecting means, for driving said second optical element from said first state to said second state regardless of whether or not a photographing operation is started.

4,941,011
SINGLE INTEGRATOR SYSTEM WITH DUAL PHOTOCELLS

David L. Farrington, Boxborough, Mass., assignor to Polaroid Corporation, Cambridge, Mass.

Filed Jun. 2, 1989, Ser. No. 360,790
Int. Cl.[5] G03B 7/087, 7/099
U.S. Cl. 354—430 7 Claims

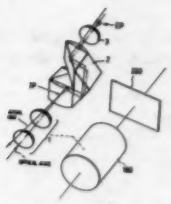


1. An exposure control circuit for a photographic apparatus, comprising:
a pair of photodetectors for respectively sensing visible and non-visible electromagnetic frequencies reflected from a photographic scene and for generating a signal representative thereof;
a common integrator for alternately integrating each said photodetector signal;
a plurality of capacitors at least equal to the number of integrations to be preformed by said integrator during an operational cycle of said photographic apparatus; and
means for interconnecting said capacitors and said common integrator such that each photodetector integration by said common integrator is stored in a different one of said capacitors and such that said stored integrated signals collectively form a signal representative of the total amount of sensed visible and invisible frequencies reflected from the photographic scene.

4,941,012
FINDER OPTICAL SYSTEM FOR CAMERAS

Tatsuo Inabata, Kunitachi, Japan, assignor to Olympus Optical Co., Ltd., Tokyo, Japan

Filed Feb. 13, 1989, Ser. No. 309,295
Claims priority, application Japan, Feb. 17, 1988, 63-32868
Int. Cl.[5] G03B 7/097
U.S. Cl. 354—478 22 Claims

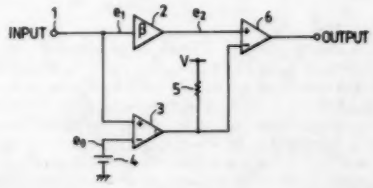


1. A finder optical system for cameras comprising:
an objective lens,
a Porro prism having a plurality of reflecting surfaces to erect an image of an object formed by the objective lens,
an eyepiece for observing the object image,
one of the reflecting surfaces of said Porro prism having properties of transmitting a part of light incident on said one of the reflecting surfaces and reflecting the remainder and
a light receiving element for photometry provided at a position where the light transmitted through said one of the reflecting surfaces can be received.

4,941,013
EXPOSURE DEVICE USING CRT AS EXPOSURE LIGHT SOURCE

Yoshimasa Hara, Nagoya, Japan, assignor to Brother Kogyo Kabushiki Kaisha, Aichi, Japan

Filed Apr. 14, 1989, Ser. No. 338,119
Claims priority, application Japan, Apr. 14, 1988, 63-49404[U]
Int. Cl.[5] G03B 27/72, 27/80
U.S. Cl. 355—20 7 Claims



1. An exposure device for an image exposure onto a photosensitive recording medium to record thereon an image corresponding in density to an image on an original, the photosensi-

tive recording medium having a non-linear characteristic in a relation between the density of the image recorded thereon and an optical radiant energy applied thereto, said device comprising:

a cathode ray tube for supplying said optical radiant energy onto said photosensitive recording medium;

a driver circuit receiving an input voltage indicative of said density of said image on said original and developing an output voltage applied to said cathode ray tube, wherein said cathode ray tube supplies said optical radiant energy in consistence with said non-linear characteristic in response to said output voltage;

said driver circuit comprising means for applying a first output voltage to said cathode ray tube when said input voltage is above a predetermined value, said first output voltage causing said cathode ray tube to supply a first optical radiant energy corresponding to said first output voltage, said photosensitive recording medium being recorded with an image of substantially 0% in density when exposed to light of said first optical radiant energy.

4,941,014

IMAGE FORMING APPARATUS

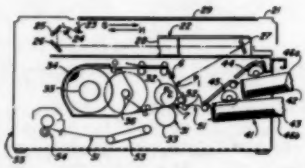
Mitsuru Ogura, Nara, Japan, assignor to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Oct. 3, 1988, Ser. No. 252,685

Claims priority, application Japan, Oct. 23, 1987, 62-268795

Int. Cl.[5] G03B *27/32, 27/52*

U.S. Cl. 355—27 **4 Claims**



1. An image forming apparatus comprising

a pair of pressure rollers which are pressed against each other while a sheet is passed therebetween,

detecting means for detecting an abnormal condition in the transportation of a sheet being passed between said pressure rollers, and

releasing means for releasing pressure between said pressure rollers when said detecting means detect an abnormal condition.

4,941,015

DEVICE FOR SCREENING A PHOTOCONDUCTIVE ELEMENT UNIT FROM EXTERNAL LIGHT

Hiroshi Komai, and Hideo Aoki, both of Yokohama, Japan, assignors to Ricoh Company, Ltd., Tokyo, Japan

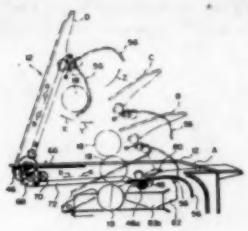
Filed Dec. 23, 1988, Ser. No. 289,240

Claims priority, application Japan, Dec. 24, 1987, 62-194780 [U]; Jul. 28, 1988, 63-99065[U]

Int. Cl.[5] G03G *15/00*

U.S. Cl. 355—200 **5 Claims**

1. In a device for use in an electrophotographic image recorder having upper and a lower unit openably hinged to each other and each being loated with a different group of structural parts and elements inclusive of a photoconductive element unit having a photoconductive drum, for screening said photoconductive element unit against external light, said device being provided with screening means, wherein said screening means is movable in interlocked relation to opening and closing motions of said upper unit such that said drum is covered by said screening means when said upper unit is open and is uncovered when said upper unit is closed, and wherein said photoconductive element unit comprises an opening provided above said drum, a belt member located to close said opening of said photoconductive element unit and formed with slit means for passing imagewise light to said drum therethrough, said belt



member being moved, when said upper unit is opened, for changing a position of said slit means until said opening of said photoconductive element has been closed by said belt member.

4,941,016

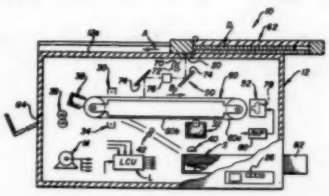
PHOTOCONDUCTIVE IMAGE RECEIVING MEMBER WITH OPTIMIZED LIGHT RESPONSE CHARACTERISTICS

Kevin M. Johnson, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Dec. 27, 1988, Ser. No. 290,673

Int. Cl.[5] G03G *15/04*

U.S. Cl. 355—202 **7 Claims**



1. For use in an electrostatographic reproduction apparatus having means for producing a direct light image of a document for optical copying of such document, means producing an electronically generated light image of information for nonimpact printing of such information, a photoconductive image receiving member upon which visible light and electronically generated light images are exposed to produce corresponding latent image charge patterns, said photoconductive image receiving member comprising:

a first portion having light responsive characteristics optimized in the range of light produced by said direct light image producing means; and

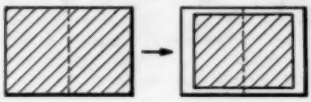
a second portion, in an adjacent area along the length of said image receiving member, having light responsive characteristics optimized in the range of light produced by said electronically generated light image producing means.

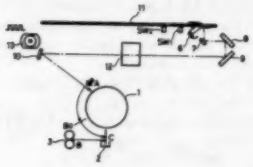
4,941,017

COPYING APPARATUS HAVING A BINDING MARGIN FORMING FUNCTION

Nobuhiro Mishima, and Kazuhiro Araki, both of Osaka, Japan, assignors to Minolta Camera Kabushiki Kaisha, Osaka, Japan

Filed Aug. 31, 1988, Ser. No. 238,843
Claims priority, application Japan, Aug. 31, 1987, 62-218492
Int. Cl.[5] G03G 15/00
U.S. Cl. 355—218 8 Claims





1. A copying apparatus having a blank margin forming function, comprising:

a rotatable photoconductor,

image forming means for forming an image of an original on said photoconductor with an arbitrary magnitude based on a copying magnification,

paper feed means for feeding paper for copy to a predetermined transfer position with specified timing,

transfer means for transferring the image on said photoconductor, formed by said image forming means onto the copy paper at said transfer position, fed by said paper feed means,

detection means for detecting a size of the copy paper fed by said paper feed means,

mode designation means for designating a blank margin forming mode for ensuring a first blank margin of a predetermined width on a leading edge of the copy paper and a second blank margin of said predetermined width on a rear edge of the copy paper,

determination means for determining said copying magnification and said specified timing in response to a designation output from said mode designation means, the determined copying magnification being a ratio of the magnitude of the image of the original formed in an image area defined by subtraction of said first and second blank margins from the size of the copy paper to a size of the original, and the determined specified timing being timing for enabling a leading edge of said image area to coincide with a leading edge of the image on said photoconductor, and

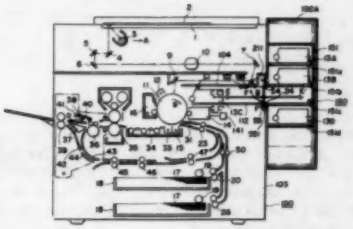
control means responsive to the output from said mode designation means, for controlling said image forming means and said paper feed means based on the copying magnification and the specified timing determined by said determination means, whereby the image of the original is copied on the copy paper with forming the first blank margin on the leading edge of the copy paper and the second blank margin on the rear edge of the copy paper, the width of said first and second blank margins being equal to each other.

4,941,018

DEVELOPING DEVICE ACCOMMODATING APPARATUS AND IMAGE FORMING APPARATUS AND DEVELOPING DEVICE

Toshirou Kasamura, Yokohama; Masashi Ohashi; Toshihiko Kusumoto, both of Tokyo; Naoki Okuda, Kawasaki; Nobukazu Sasaki, Yokohama; Yasunori Maeda, Inagi; Akiyoshi Kimura, Kawasaki; Katsumi Munenaka, Tokyo; Yoshikuni Toyama, Yokohama; Minoru Nada; Ken Tanabe, both of Kawasaki; Masamichi Ikeda; Yasuhide Hishikawa, both of Yokohama, and Takashi Ozawa, Ichikawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 217,078, Jul. 8, 1988, abandoned, which is a continuation of Ser. No. 111,761, Oct. 23, 1987, abandoned.
This application Dec. 27, 1988, Ser. No. 289,521
Int. Cl.[5] G03G 15/01
U.S. Cl. 355—245 37 Claims



1. An apparatus for accommodating a plurality of developing devices, comprising:

an accommodating case movable substantially vertically, including plural partition stages arranged vertically for movably accommodating the plural developing devices and a drive receiving member for fixedly supporting said partition stages and for receiving driving force in a substantially vertical direction;

a moving mechanism for engaging with a selected one of the developing devices on the partition stages to move the selected developing device relative to the partition stage in a horizontal plane;

means for mounting said accommodating apparatus to an image forming apparatus with which said accommodating apparatus is used; and

means for detecting colors of the developers contained in the developing devices.

5. An apparatus for accommodating a plurality of developing devices, comprising:

an accommodating case movable substantially vertically, including plural partition stages arranged vertically for movably accommodating the plural developing devices and a drive receiving member for fixedly supporting said partition stages and for receiving driving force in a substantially vertical direction;

a moving mechanism for engaging with a selected one of the developing devices on the partition stages to move the selected developing device relative to the partition stage in a horizontal plane;

means for mounting said accommodating apparatus to an image forming apparatus with which said accommodating apparatus is used;

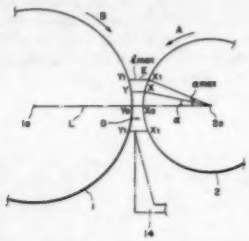
means for feeding a sheet to said image forming apparatus, said feeding means being disposed below a lowermost one of the partition stages; and

a driving source for driving said feeding means and said accommodating case and switching means for switching transmission of the driving force between said feeding means and said accommodating means.

4,941,019
APPARATUS FOR DEVELOPING ELECTROSTATIC LATENT IMAGE

Takao Honda, Kawasaki, and Yoshiaki Kobayashi, Yokohama, both of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 13, 1989, Ser. No. 337,655
Claims priority, application Japan, Apr. 15, 1988, 63-091266; Jun. 24, 1988, 63-154954
Int. Cl.[5] G03G *15/09*
U.S. Cl. 355—251 **13 Claims**



1. A developing apparatus for developing an electrostatic latent image formed on an image bearing member, comprising:

a rotatable developer carrying member faced to the image bearing member in a developing zone, for carrying a developer having a magnetic property and for carrying it to the developing zone;

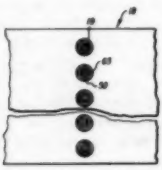
a developer regulating member for regulating a layer of the developer on said developer carrying member to a thickness smaller than a minimum clearance between the image bearing member and the developer carrying member in the developing zone;

a magnet stationarily disposed in said developer carrying member, said magnet having a magnetic pole for erecting a brush of the developer on said developer carrying member in the developing zone, wherein a position where an absolute value of a change rate of a perpendicular component of a magnetic field on a surface of said developer carrying member with respect to a rotational direction of said developer carrying member takes a local maximum is adjacent an outlet end of the developing zone, and wherein the local maximum is not less than 30 Gausses per degree.

4,941,020
TRANSFER APPARATUS HAVING VACUUM HOLES FOR HOLDING A RECEIVING SHEET

Richard C. Baughman, Geneseo; William Y. Fowlkes, Brockport; Bruce J. Rubin, Rochester, and William B. Vreeland, Webster, all of N.Y., assignors to Eastman Kodak Company, Rochester, N.Y.

Filed Jul. 3, 1989, Ser. No. 375,165
Int. Cl.[5] G03G *15/16*
U.S. Cl. 355—275 **9 Claims**



1. Apparatus for transferring a toner image from an image-bearing member to a receiving sheet, which apparatus includes:

a transfer drum having a conductive surface and having vacuum holes to said surface,

means for applying a vacuum to said vacuum holes to hold a receiving sheet on the surface of the transfer drum,

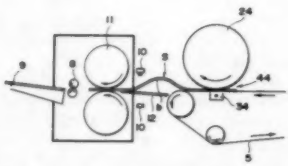
means for creating an electric field urging a toner image toward said transfer drum, and

a screen positioned across the top of each of said vacuum holes which screen is sufficiently conductive to improve the continuity of the electric field in the vicinity of the vacuum hole, said screen having fibers which run in a direction generally parallel to the axis of the drum which are sufficiently conductive to improve the continuity of the transfer field and fibers running around the surface of the drum which are sufficiently insulative to reduce the tendency for ionization in a transfer nip created by the drum and the image-bearing member.

4,941,021
IMAGE FORMING APPARATUS WITH RECORDING MATERIAL LOOP FORMING AND CONTROL MEANS

Takashi Uchida, Kawasaki; Osamu Hoshino, and Yasushi Murayama, both of Tokyo, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 28, 1989, Ser. No. 318,464
Continuation of Ser. No. 1,176, Jan. 7, 1987, abandoned.
Claims priority, application Japan, Jan. 10, 1986, 61-3185; Jan. 10, 1986, 61-3186
Int. Cl.[5] G03G *15/20*
U.S. Cl. 355—285 **13 Claims**



1. An image forming apparatus comprising:

image forming means for forming an unfixed toner image on recording material;

fixing means having a pair of rotatable members for conveying the recording material therebetween and fixing said unfixed toner image on the recording material, a distance along a conveyance path of the recording material between a position at which the unfixed toner image is formed on the recording material by said image forming means and a nip position of said pair of rotatable members being shorter than the length of the recording material used with respect to a direction of conveyance of the recording material;

conveying means for conveying the recording material having said unfixed toner image formed thereon to said fixing means;

drive means for rotatably driving said pair of rotatable members selectively at a first peripheral speed lower than a speed at which said conveying means conveys the recording material and a second peripheral speed higher than the speed at which said conveying means conveys the recording material; and

control means for controlling said drive means, said control means controlling said drive means so as to rotate said pair of rotatable members at said first peripheral speed to thereby convey the recording material and to form a loop of the recording material having said unfixed toner image formed thereon between the nip position of said pair of rotatable members and the position at which the unfixed toner image is formed on the recording material by said image forming means, and thereafter to change said first peripheral speed to said second peripheral speed, thereby

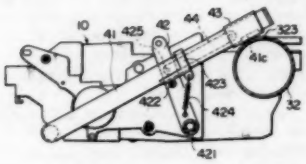
suppressing growth of the loop of said recording material greater than a predetermined amount.

4,941,022

TONER RECOVERY DEVICE

Atsuo Ohmura; Jun-ichi Koiso; Kohji Ishii, and Mitsugu Nemoto, all of Hachioji, Japan, assignors to Konica Corporation, Tokyo, Japan

Filed Nov. 6, 1989, Ser. No. 432,000
Claims priority, application Japan, Nov. 11, 1988, 63-284971; Dec. 13, 1988, 63-314254; Dec. 28, 1988, 63-334544
Int. Cl.[5] G03G 21/00
U.S. Cl. 355—298 6 Claims



1. A toner recovery device for collecting toner from a cleaning device to a recovery toner container, comprising

a toner conveyance means for conveying toner from said cleaning device to said recovery toner container, said toner conveyance means having a conveyance pipe whose base end portion is rotatably connected to said cleaning device and tip end portion with an outlet opening is detachably coupled to an inlet opening of said recovery toner container so that said tip end portion is pivotted around said base end portion so as to take the coupled position and the detached position;

an operating lever means linked to said conveying pipe for pivotting said tip end portion between the coupled position and the detached position;

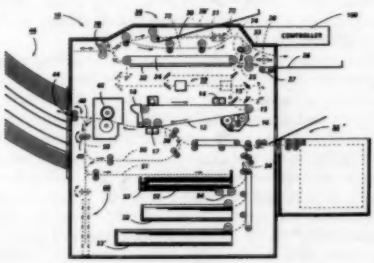
a shutter means adapted to move on said conveying pipe interlockingly with the movement of said operating lever means so that said shutter means closes the outlet opening of said conveying pipe on the detached position and opens the outlet opening on the coupled position.

4,941,023

HYBRID SEQUENCED DOCUMENT COPYING SYSTEM

Maurice F. Holmes, Rochester; George J. Roller, Penfield, and Steven R. Moore, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Nov. 22, 1988, Ser. No. 274,517
Int. Cl.[5] G03G 15/00; B65H 5/22
U.S. Cl. 355—319 26 Claims



1. In a copier for making plural collated sets of duplex copies from a stacked set of simplex or duplex document sheets, with a document feeder for sequentially feeding the document sheets from said stack to the input side of a copying station of the copier to be copied on one side, and then ejecting the document sheets after they are copied from the output side of the copying station, and wherein there is also provided in the copier a copy sheet trayless duplexing buffer loop path means of a preset limited path length extending from and back to a copy sheet image transfer station, for copying document images onto both the first and second sides of copy sheets to make said duplex copies without any intermediate copy sheet stacking between first and second side copying by continuously circulating and inverting copy sheets in said trayless duplexing buffer loop between their first and second side copying, the improvement wherein:

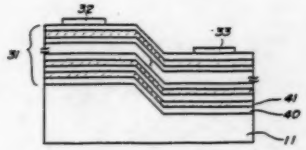
said document feeder has a document platen bypass loop path means for intermittently taking selected document sheets already copied once at said copying station and ejected from said output side of said copying station and for returning said selected document sheets from said output side back to said input side of said copying station without returning to said stack, for subsequently copying said selected document sheets again after at least one other document sheet fed from said stack is copied at said copying station but prior to the copying of the other said document sheet from said stack, said selected document sheets being intermittently fed, bypassing said stack, by said document platen bypass loop path means to said input side of said copying station interleaved between other document sheets being fed directly from said stack to said copying station in a selection order coordinated with said trayless duplexing buffer loop path means for efficient utilization thereof for said making of said duplex copies.

4,941,024

SEMICONDUCTOR APPARATUS

Toshiro Hayakawa, Nara; Takahiro Suyama, Tenri, and Saburo Yamamoto, Nara, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation of Ser. No. 757,977, Jul. 23, 1985, abandoned. This application Oct. 11, 1988, Ser. No. 256,097
Claims priority, application Japan, Jul. 31, 1984, 59-163213
Int. Cl.[5] H01L 27/12
U.S. Cl. 357—4 5 Claims



1. A semiconductor apparatus comprising:

a step-shaped substrate;

a multiple-layered step-shaped crystal structure formed on said step-shaped substrate, said multiple-layered crystal structure being of a superlatticed layer which is composed of a plurality of alternate thin layers consisting of first and second semiconductor material of a uniform thickness throughout each layer, each layer being grown by molecular beam epitaxy in accordance with angular portions of said step-shaped substrate without formation of a twin; and

electrodes formed on an upper portion and a lower portion of said multiple-layered step-shaped crystal structure.

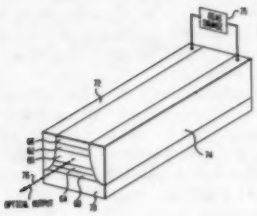
4,941,025
QUANTUM WELL SEMICONDUCTOR STRUCTURES FOR INFRARED AND SUBMILLIMETER LIGHT SOURCES

Nader Tabatabaie, Red Bank, N.J., assignor to Bell Communications Research, Inc., Livingston, N.J.

Continuation-in-part of Ser. No. 139,380, Dec. 30, 1987. This application Nov. 28, 1988, Ser. No. 276,954

Int. Cl.[5] G06F *11/10*; **H03M** *13/12*; **H01L** *29/161, 33/00*

U.S. Cl. 357—16 **6 Claims**



1. A quantum well structure comprising

a layered semiconductor definitive of a quantum well profile containing at least two subbands both within either the conduction band or the valence band, said subbands being characterized by an enhanced carrier conductivity difference between the subbands, the doping of said layered semiconductor establishing carrier population only within the lower-energy subband,

and means for establishing a dynamic population inversion between said subbands in the quantum well profile,

wherein said means for establishing a dynamic population inversion includes means for applying an electric field parallel to the layers of said structure.

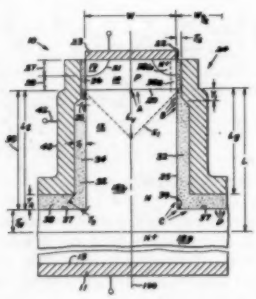
4,941,026
SEMICONDUCTOR DEVICES EXHIBITING MINIMUM ON-RESISTANCE

Victor A. K. Temple, Clifton Park, N.Y., assignor to General Electric Company, Schenectady, N.Y.

Continuation of Ser. No. 938,692, Dec. 5, 1986, abandoned. This application Aug. 26, 1988, Ser. No. 239,014

Int. Cl.[5] H01L *29/78*

U.S. Cl. 357—23.4 **63 Claims**



1. A semiconductor device comprising:

a body of semiconductor material having first and second opposed major surfaces and including:

a drift layer of semiconductor material exhibiting a concentration X of dopant impurities therein;

a second layer of semiconductor material between said drift layer and said first major surface;

a trench extending into said body from said first major surface through said second layer and extending a distance L_t into said drift layer to define a pedestal portion of said body having a width W and including portions of said drift and second layers, said drift layer portion of said pedestal having an aspect ratio L_t/W which is greater than or equal to 0.5, an area charge density of WX greater than or equal to $\epsilon E_{AV}/2q$, wherein ϵ is the permittivity of the semiconductor material, E_{AV} is the electric field strength at avalanche breakdown and q is the electron charge;

means associated with said drift layer portion of said pedestal for diverting electric field lines originating with said dopant impurities of said drift layer portion of said pedestal to thereby increase the voltage supporting potential of said drift layer portion of said pedestal and said device; and

a first main electrode disposed on said first major surface in ohmic contact therewith; and

a second main electrode disposed on said second major surface in ohmic contact therewith;

the main ON-state current path through said device extending between said first and second main electrodes and, when said device is in said ON-state, said pedestal portion of said drift layer is free of inversion layers.

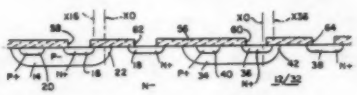
4,941,027
HIGH VOLTAGE MOS STRUCTURE

James D. Beasom, Melbourne, Fla., assignor to Harris Corporation, Melbourne, Fla.

Division of Ser. No. 620,834, Jun. 15, 1984, abandoned. This application Feb. 27, 1989, Ser. No. 302,386

Int. Cl.[5] H01L *11/00*

U.S. Cl. 357—23.12 **17 Claims**



1. An integrated circuit comprising:

a first insulated gate field effect transistor having a first threshold voltage including a first body region of a first conductivity type in a substrate of a second conductivity type, said substrate forming a first drain region, said body having a constant impurity concentration region and a decreasing impurity concentration region, a first source region of said second conductivity type in said constant impurity region of said first body region and separated from said first drain by said decreasing impurity region, which forms a first channel region, and a first gate over said first channel region and separated therefrom by an insulative layer; and

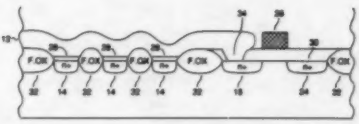
a second insulated gate field effect transistor having a second threshold voltage lower than said first threshold voltage including a second body region of said first conducting type in said substrate, said substrate forming a second drain region, said body having a constant impurity concentration region and a decreasing impurity concentration region, and second source region of said second conductivity type in said decreasing impurity region and separated from said second drain by said decreasing impurity region which forms a second channel region and a second gate over said second channel region and separated therefrom by an insulative layer, said second threshold being set by the location of the edge of said second source region in said decreasing impurity region.

4,941,028

STRUCTURE FOR PROTECTING THIN DIELECTRICS DURING PROCESSING

Shih-Ou Chen, Fremont; John L. McCollum, and Steve S. Chiang, both of Saratoga, all of Calif., assignors to Actel Corporation, Sunnyvale, Calif.

Filed Aug. 10, 1988, Ser. No. 230,463
Int. Cl.[5] H01L 21/76
U.S. Cl. 357—23.13 5 Claims



5. In an integrated circuit having a dielectric located between a first diffusion region of a first conductivity type in a substrate of a second conductivity type and an upper conductor, a structure for protecting said dielectric from damage due to static charge buildup during processing and storage of said circuit, including:

a second diffusion region of said first conductivity type in said substrate connected to said upper conductor by a buried contact,

a well of said first conductivity type in said substrate,

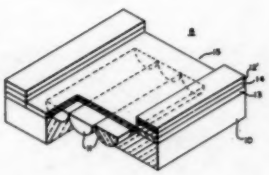
a diffusion of said second conductivity type in said well connected to said upper conductor by a buried contact.

4,941,029

HIGH RESISTANCE OPTICAL SHIELD FOR VISIBLE SENSORS

Nathan Bluzer, Silver Spring, Md., assignor to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Feb. 27, 1985, Ser. No. 706,436
Int. Cl.[5] H01L 27/14, 31/00
U.S. Cl. 357—30 4 Claims



1. In combination with a solid state imaging device comprising silicon chip means incorporating photodetectors and photo signal processing circuitry sensitive to light and a light shield means disposed as a layer upon said photo signal processing circuitry and any other elements sensitive to light which are required to be shielded from light for proper device operation, the improved light shield means comprising:

a high electrical resistance semiconductor means conformed as said light shield layer, said semiconductor means having a lower band gap than the band gap of silicon which comprises said chip means; and

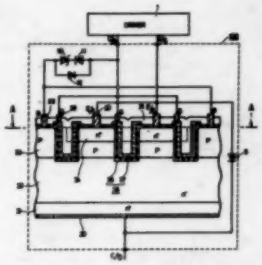
said semiconductor means layer having a predetermined thickness sufficient to provide incident light shielding.

4,941,030

SEMICONDUCTOR DEVICE

Gourab Majumdar, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Feb. 4, 1986, Ser. No. 825,868
Claims priority, application Japan, Feb. 5, 1985, 60-20474
Int. Cl.[5] H01L 27/02, 29/78, 29/06
U.S. Cl. 357—43 8 Claims



1. A semiconductor device comprising a MOSFET and a bipolar transistor, including:

a semiconductor substrate (21, 22) of a first conductivity type having a first surface, said substrate forming a collector of said bipolar transistor and a drain of said MOSFET;

a first semiconductor layer (23) of a second conductivity type formed on an opposing surface of said semiconductor substrate (21, 22) opposing said first surface and forming a base of said bipolar transistor;

a second semiconductor layer (24) of said first conductivity type provided as an island extending from an exposed surface of said first semiconductor layer (23) toward said first surface and smaller in thickness than said first semiconductor layer (23), said second layer forming both an emitter of said bipolar transistor and a source of said MOSFET; and

at least one groove (25) formed in a region of said second semiconductor layer (24), said groove (25) being formed to reach at least an interface between said semiconductor substrate (22) and said first semiconductor layer (23), a gate electrode of said MOSFET comprising a conductive material (27) on a surface of the groove and separated from said surface of said groove by a dielectric film (26)

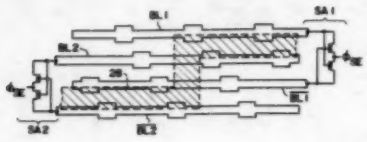
wherein a conductive film (20) is formed on said first surface of said semiconductor substrate (21, 22), and a region adjacent said groove (25) comprises a gate region thereby to form, together with said drain and said source, said metal-oxide-semiconductor field-effect transistor (MOSFET);

wherein said first semiconductor layer (23) and said conductive material (27) of said groove region (25) are connected through a series element including a first diode (11) connected in an electrically forward direction with respect to said conductive material (27) of said groove region (25), said first diode connected in series with a constant-voltage diode (10) in an electrically reverse direction thereto, said series element including a second diode (12) connected in parallel with said first diode and said constant voltage diode in an electrically reverse direction relative to said conductive material (27) of said groove region (25), and further including an additional diode (5) connected between said second semiconductor layer (24) and said semiconductor substrate (21, 22) in an electrically forward direction relative to said second semiconductor layer (24) thereby to form a high-voltage/high-current switching device capable of high-speed operation.

4,941,031
DYNAMIC MEMORY DEVICE WITH IMPROVED WIRING LAYER LAYOUT

Jumpei Kumagai, Yokohama, and Syuso Fujii, Kawasaki, both of Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Oct. 3, 1989, Ser. No. 416,604
Claims priority, application Japan, Nov. 16, 1988, 63-289259
Int. Cl.[5] H01L *27/10, 23/48, 27/02, 29/78*
U.S. Cl. 357—45 **20 Claims**



1. A dynamic memory device comprising:

a plurality of memory cells each including one transistor and one capacitor;

first and second bit lines each coupled with a plurality of memory cells and being arrayed in parallel with separation of a first predetermined distance;

first sense amplifier coupled with said first and second bit lines;

third and forth bit lines each coupled with a plurality of memory cells and being arrayed in parallel with separation of said first predetermined distance, said third bit line being located between said first bit line and said second bit line, and separated from said first bit line by a second predetermined distance, and said fourth bit line being separated from said second bit line by said second predetermined distance;

second sense amplifier coupled with said third and fourth bit lines; and

a conductive layer extending in the bit line direction, said conductive layer extending between and along said first and third bit lines, being bent at a predetermined position, and being bent again and extending between and along said second and fourth bit lines, and a length of said conductive layer which extends between and along said first and third bit lines being equal to that of said conductive layer which extends between and along said second and fourth bit lines.

4,941,032
SEMICONDUCTOR DEVICE

Kenji Kobayashi; Masataka Kondo; Kazunori Tsuge, and Yoshihisa Tawada, all of Kobe, Japan, assignors to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha, Osaka, Japan

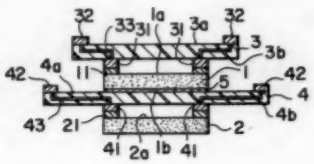
Continuation of Ser. No. 21,039, Mar. 2, 1987, abandoned. This application Jan. 13, 1989, Ser. No. 298,279
Claims priority, application Japan, Mar. 3, 1986, 61-47122
Int. Cl.[5] H01L *23/54, 21/44*
U.S. Cl. 357—67 **17 Claims**

1. A semiconductor device comprising an amorphous semiconductor which might contain microcrystals therein, and a metal electrode directly in contact with said amorphous semiconductor, wherein said metal electrode consists essentially of Al as a first component, and at least one additional component selected from the group consisting of (i) Ag, (ii) Au, (iii) Ca, Mg, Mn, W, Cr or Cu, (iv) Zn or Ge, and (v) Fe, Mo, Ni, Pd, Pt, Ti, V or Zr.

4,941,033
SEMICONDUCTOR INTEGRATED CIRCUIT DEVICE

Satoru Kishida, Itami, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Japan

Filed Mar. 24, 1989, Ser. No. 328,539
Claims priority, application Japan, Dec. 27, 1988, 63-327609
Int. Cl.[5] H01L *23/12, 23/14, 23/04*
U.S. Cl. 357—75 **17 Claims**



1. A semiconductor integrated circuit device comprising:

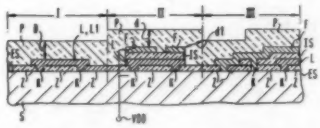
first and second semiconductor chips, each chip having opposed front and rear surfaces and a plurality of electrodes disposed on the front surface; and

first and second wiring films, each wiring film having opposed front and rear sides, including a plurality of first and second terminals disposed on the front and rear sides, respectively, and wiring within each wiring film interconnecting respective first and second terminals, the second terminals of the first and second wiring films being disposed in correspondence with and attached to the electrodes of the first and second chips, respectively, wherein the first and second chips and the first and second wiring films are all disposed opposite each other, in a stack, one of (i) the first and second wiring films and (ii) the first wiring film and second chip being attached to each other.

4,941,034
INTEGRATED SEMICONDUCTOR CIRCUIT

Hartmut Schrenk, Haar, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Continuation of Ser. No. 921,756, Oct. 22, 1986. This application Jul. 5, 1988, Ser. No. 218,493
Claims priority, application Fed. Rep. of Germany, Oct. 22, 1986, 3537590
Int. Cl.[5] H01L *23/48, 29/46, 29/54*
U.S. Cl. 357—71 **7 Claims**



1. Integrated semiconductor circuit, comprising a substrate, a layer of electrical structures disposed in said substrate; conductor runs connected to said electrical structures; at least one electrically conducting surface element covering only a part of said conductor runs; an insulating layer electrically insulating said at least one surface element from said part of said conductor runs being covered by said surface element; a passivating layer covering said substrate, said electrical structures, said conductor runs and said at least one surface element; said at least one surface element having at least the same thickness and the same chemical properties as said conductor runs; and said passivating layer being at least as thick above said at least one surface element covering said part of the conductor runs as above the remaining conductor runs; wherein said at least one

surface element is in the form of a plurality of surface elements and at least one of said surface elements is electrically insulated.

4,941,035

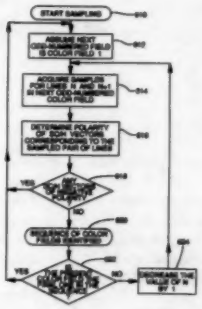
METHOD OF SAMPLING COLOR VIDEO SIGNAL HAVING ALTERNATING PHASE CHARACTERISTICS

John L. Judge, Hillsboro, Oreg., assignor to Magni Systems, Inc., Beaverton, Oreg.

Continuation-in-part of Ser. No. 17,314, Feb. 20, 1987, Pat. No. 4,792,845. This application Dec. 16, 1988, Ser. No. 285,775

Int. Cl.[5] H04N *9/44*

U.S. Cl. 358—10 **8 Claims**



1. In a system for measuring the phase characteristics of a color video signal arranged in a sequence of plural color frames of which each includes plural video image scan lines, the color video signal including for each video image scan line a phase characteristic that has one of first and second polarities, a method of sampling the color video signal, comprising:

sampling the color video signal during first and second video image scan lines within a first one of the plural color frames in the sequence, each of the first and second video image scan lines being characterized as having one of the first and second polarities;

determining whether the polarities of the sampled first and second video image scan lines match the polarities of the color video signal during corresponding first and second video image scan lines in a preselected color frame in the sequence of color frames, thereby to identify the preselected color frame; and

whenever the preselected color frame is identified, sampling the color video signal during third and fourth video image scan lines that are within a second one of the plural color frames and that have the polarities of the first and second video image scan lines.

4,941,036

COMMAND SENSOR IN PROJECTION DISPLAY APPARATUS

Masateru Itoh, Nagaokakyo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Nov. 7, 1988, Ser. No. 267,563

Claims priority, application Japan, Nov. 12, 1987, 62-287978

Int. Cl.[5] H04N *5/74, 9/31*

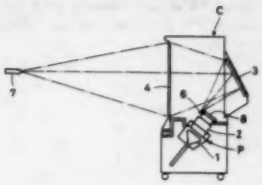
U.S. Cl. 358—60 **10 Claims**

1. A back-projection picture display apparatus comprising:

a back-projection screen including a Fresnel lens plate;

a video projector unit; and

a remote control system including a remote controller for generating an infrared beam of a particular characteristic descriptive of a particular command with which the apparatus is operated and a command sensor operable in response to the infrared beam to operate the apparatus to accomplish a mode of operation assigned by such particular command, said command sensor being arranged at a location where the infrared beams passing through the Fresnel lens plate are converged.



4,941,037

COLOR IMAGE PROCESSING METHOD AND APPARATUS IN WHICH A GRADATION-CONVERTED LUMINANCE SIGNAL AND TWO NON-LINEARLY QUANTIZED COLOR-DIFFERENCE SIGNALS HAVING FEWER BITS THAN THE LUMINANCE SIGNAL ARE USED TO ADDRESS A COLOR MASKING ROM

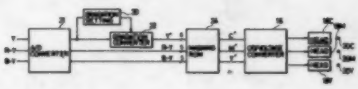
Takashi Sasaki, and Yoshiro Udagawa, both of Tokyo, Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 838,784, Mar. 12, 1986, abandoned. This application May 2, 1988, Ser. No. 188,644

Claims priority, application Japan, Mar. 21, 1985, 60-56632

Int. Cl.[5] G03F *3/08*; H04N *1/40, 1/46*

U.S. Cl. 358—80 **19 Claims**



1. A color image processing method comprising the steps of:

obtaining a luminance signal and two color difference signals based on primary colors;

gradation converting said luminance signal in accordance with a characteristic thereof to provide a converted luminance signal having a number of bits;

non-linearly quantizing said two color difference signals to provide two quantized color difference signals each having a number of bits, wherein the number of bits of each of said quantized color difference signals is smaller than the number of bits of said converted luminance signal;

performing a masking process using masking process means that includes a storage circuit for storing a plurality of complementary color signal levels at addresses of said storage circuit and for accepting as an input address said converted luminance signal and said two quantized color difference signals to provide as an output at least one of said complementary color signal levels stored in said storage circuit; and

providing said output complementary color signal levels to a color printing device.

14. A color image processing apparatus comprising:

supplying means for supplying a luminance signal and two color difference signals based on primary colors;

processing means for processing said luminance signal and said two color difference signals supplied by said supplying means, wherein said processing means performs processing for said luminance signal and said two color difference signals, the processing for said luminance signal and the processing for said two color difference signals being different from each other; and

output means for accepting said luminance signal and said two color difference signals and outputting a masking-

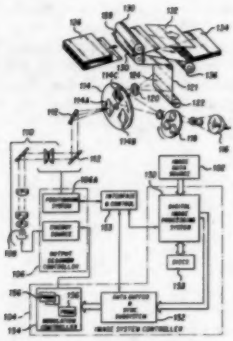
processed complementary color signal, wherein said output means includes a memory circuit for storing levels of said complementary color signal accessed using as an input address a value according to said luminance signal and said two color difference signals processed by said processing means.

4,941,038

METHOD FOR COLOR IMAGE PROCESSING

Eric Walowit, Springboro, Ohio, assignor to The Mead Corporation, Dayton, Ohio

Continuation-in-part of Ser. No. 48,156, May 11, 1987. This application Jan. 13, 1989, Ser. No. 297,223
Int. Cl.[5] G03F 3/08
U.S. Cl. 358—80 25 Claims



1. A method of converting input color data to output color data comprising the steps of:

calibrating in a first calibration an input device to an intermediate color space;

calibrating in a second calibration an output device to said intermediate color space;

collecting said input color data from said input device;

converting said input color data to intermediate color space data in accordance with said first calibration;

outputting said color data to said output device;

wherein said converting of said intermediate color space data to said output color data includes processing said intermediate color space data for matching an input gamut to an output gamut for said output device, and wherein said intermediate color space is a uniform color space;

said processing includes identifying at least one unprintable device independent color output value which, when converted to a device dependent color output value, cannot be represented by said output device, and determining an adjusted device dependent color output value for representing said device independent color output value which is within said output gamut;

said adjusted device dependent color output value being determined within said intermediate color space;

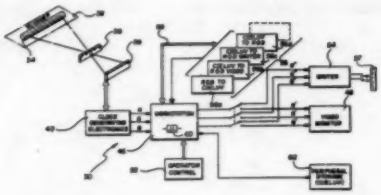
said adjusted device dependent color value being determined as the shortest vector distance within said intermediate color space between said unprintable color output value and a color output value which is printable by said output device.

4,941,039

COLOR IMAGE REPRODUCTION APPARATUS HAVING A LEAST SQUARES LOOK-UP TABLE AUGMENTED BY SMOOTHING

John R. E'Errico, Rochester, N.Y., assignor to Eastman Kodak Company, Rochester, N.Y.

Filed Apr. 4, 1989, Ser. No. 332,824
Int. Cl.[5] G03F 3/08
U.S. Cl. 358—80 4 Claims



1. In imaging apparatus including an input device adapted to produce a multivariate signal representing an input image, a look-up table characterized by a series of discrete multivariate input signal values that are functionally related in a non-linear manner to a corresponding series of discrete reproduction signal values representative of useable output image information, and electronic computer means coupling said input device and said look-up table, for linearly interpolating between neighboring multivariate signal values in said look-up table in accordance with an actual multivariate signal provided by said input device, to compute a reproduction signal relating to an output image actually to be used, wherein the improvement comprises:

the discrete reproduction signal values, b_i, in said look-up table are computed by means of a least squares algorithm applied to the combination of (1) a first array of data, S, relating a series of values, Y, of a dependent variable of an input data set to the series of reproduction signal values to be computed for said look-up table, and (2) a second array of data, ρ, relating a series of values of the second derivative of the non-linear function represented by the input data set, evaluated at selected input signal values, x_i, of said look-up table, to the series of reproduction signal values for said look-up table.

4,941,040

CABLE TELEVISION SYSTEM SELECTIVELY DISTRIBUTING PRE-RECORDED VIDEO AND AUDIO MESSAGES

Terrence H. Pocock, Mount Brydges; Peter J. M. Coumans; Richard M. McNorgan, both of London, and George M. Hart, Newmarket, all of Canada, assignors to Cableshare, Inc., London, Canada

Division of Ser. No. 730,822, May 6, 1985, Pat. No. 4,734,764. This application Feb. 10, 1988, Ser. No. 154,386
Claims priority, application Canada, Apr. 29, 1985, 480334
The portion of the term of this patent subsequent to Mar. 29, 2005, has been disclaimed.
Int. Cl.[5] H04N 7/10
U.S. Cl. 358—86 12 Claims

1. In a television system of the type in which video information is transmitted on a primary communication link to a node, and disseminated to subscribers via secondary paths from the node to subscribers' receivers, apparatus for providing different individual video presentations to different respective subscribers, comprising:

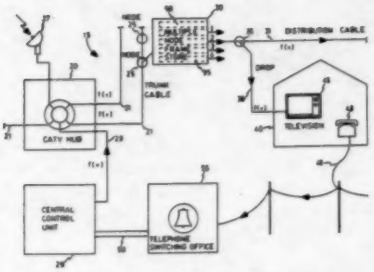
a plurality of video storage devices for storing various video presentations;

means responsive to subscriber-initiated request for selecting individual presentations stored in the storage devices and

encoding each selected presentation with an address associated with a subscriber;

means for assembling the presentations selected by different subscribers into a video signal and transmitting the video signal on said primary link;

means at said node for receiving the video signal transmitted over said primary link and storing selected presentations encoded with predetermined addresses; and



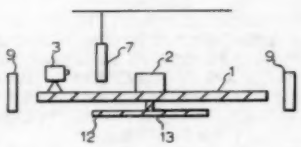
means at said node for repetitively transmitting the stored presentations at a standard video signal rate via a single television channel but over different respective secondary paths so that all subscribers connected to said node can each view their respective presentations by tuning television receivers to said television channel.

4,941,041

PULFRICH ILLUSION TURNTABLE

Keith E. Kenyon, 14434 Hamlin St., Ste. 4, Van Nuys, Calif. 91401

Filed Apr. 11, 1989, Ser. No. 336,052
Int. Cl.[5] H04N *13/02*
U.S. Cl. 358—89 **16 Claims**



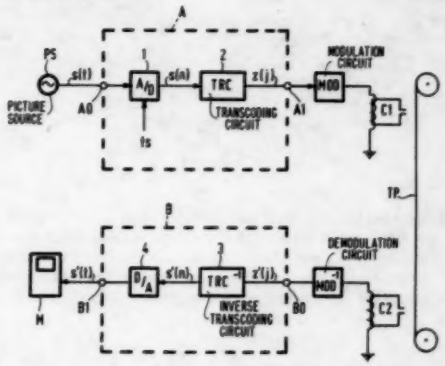
1. The method of obtaining deep in-depth perception or 3-dimensional effects from 2-dimensional images which comprises the steps of producing proper lighting, color, and special angles for moving-picture-shooting devices, such as television cameras, videotaping cameras, and film cameras engaged in shooting such 3-D images by taking advantage of the Pulfrich illusion which is created by precise camera motion, obtained by mounting one or more cameras on top of and near the edge of a turntable, while the subect or subjects being televized or videotaped are placed at or near its center and enabling the turntable to rotate during shooting and in which a darkened lens shading one eye of the viewer at a time may be employed to enhance the 3-D effect.

4,941,042

TELEVISION TRANSMISSION SYSTEM INCLUDING A HYBRID ENCODING CIRCUIT

Jean B. O. S. Martens, Eindhoven, Netherlands, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,550
Claims priority, application Netherlands, May 3, 1988, 8801155
Int. Cl.[5] H04N *7/133, 7/137*
U.S. Cl. 358—133 **4 Claims**



1. A television transmission system for transmitting pictures comprising $E_1 \times E_2$ pixels from an encoding station to a decoding station, characterized in that the encoding station comprises:

means for performing a number of forward picture transforms on the picture to be transmitted for generating the same number of matrixes of coefficients of a mutually different order;

means for coverting each one of a number of selected matrixes of coefficients into a matrix of prediction coefficients of a first higher order;

means for each time subtracting a matrix of prediction coefficients and a matrix of coefficients of the same order for generating matrixes of difference coefficients;

means for selecting difference coefficient matrixes for transmitting their difference coefficients to the decoding station; and in that the decoding station comprises:

means for converting each of the transmitted difference coefficient matrixes into a matrix of auxiliary coefficients comprising $E_1 \times E_2$ auxiliary coefficients; and

means for adding all auxiliary coefficient matrixes of a picture.

4,941,043

METHOD FOR REDUCING BLOCKING ARTIFACTS IN VIDEO SCENE CODING WITH DISCRETE COSINE TRANSFORMATION (DCT) AT A LOW DATA RATE

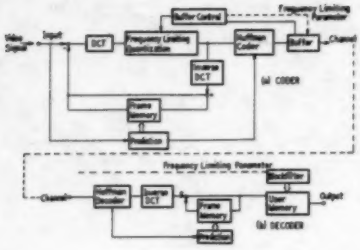
Wieland Jass, Baldham, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jun. 7, 1989, Ser. No. 362,700
Claims priority, application Fed. Rep. of Germany, Jun. 14, 1988, 3820266
Int. Cl.[5] H04N *7/133*
U.S. Cl. 358—133 **6 Claims**

1. A method for reducing blocking artifacts in a video scene coding with discrete cosine transformation (DCT) at a low data rate, characterized by the steps of

in a video signal transmission system (FIG. 1*a*, FIG. 1*b*) having a transmission-side video signal input to which a video signal to be transmitted is supplied, transmitting, via a transmit-side coder, the frequency limitation parameters allocated to the individual blocks of the video signal to be

divided into a plurality of blocks, transmitting these to a receive-side decoder via a transmission channel together with a block-associated video sub-signal that is coded by the coder; and



employing the frequency limitation parameters at the receiver-side for the purpose of controlling a block filter function at the output of the decoder that outputs a decoded video signal, for postprocessing of the decoded video signal for the purpose of reducing the blocking artifacts.

4,941,044

PROCESSING SUB-SAMPLED SIGNALS

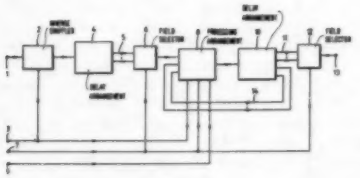
Timothy I. P. Trew, Horley, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed May 17, 1989, Ser. No. 353,360

Claims priority, application United Kingdom, Jun. 1, 1988, 8812961

Int. Cl.[5] H04N 7/13

U.S. Cl. 358—138 **30 Claims**



1. A method of processing a signal representing a sequence of two-dimensional images conveyed in sub-sampled form by way of a transmission channel or record carrier and subjected, prior to said conveyance, to different sampling structures on a segmented basis depending on the degree of movement and/or the character of spatial information, said method including the step of receiving the sub-sampled signal from said transmission channel or record carrier sequentially on a field by field basis, said method being characterized by the further steps of:

i. forming from said received sub-sampled signal a further sub-smapled signal containing the same information but in which the order of the fields is changed compared with that in said received signal;

ii. subjecting said further sub-sampled signal to inter-field and/or intra-field processing; and

iii. forming from the resulting processed signal an output signal in which the order of the fields is restored to the sequence present in said received signal.

4,941,045

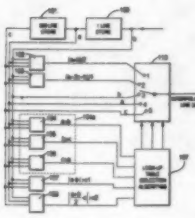
METHOD AND APPARATUS FOR IMPROVING VERTICAL DEFINITION OF A TELEVISION SIGNAL BY SCAN CONVERSION

Christopher H. Birch, Toronto, Canada, assignor to Scientific-Atlanta, Inc., Atlanta, Ga.

Filed Oct. 11, 1988, Ser. No. 255,328

Int. Cl.[5] H04N 7/01, 7/12, 7/18

U.S. Cl. 358—140 **17 Claims**



1. A scan conversion method at or near the location of a television signal receiver for improving vertical resolution by interpolation in the event of a moving image comprising the steps of:

(i) storing data values for adjacent picture elements separated by one vertical line from picture elements of a current field,

(ii) storing at least a data value for one picture element for the previous field proximate in vertical location to the adjacent picture elements of step (i),

(iii) rank ordering in amplitude level the data values stored in steps (i) and (ii),

(iv) determining whether the difference of the data values for adjacent picture elements of step (i) exceeds a first predetermined value,

(v) determining the event of a moving image by calculating whether the difference in data values between fields exceeds a second predetermined value,

(vi) mathematically calculating an average value from at least two of the picture element data values of steps (i) or (ii), and

(vii) selecting one of the data values of steps (i) or (ii) or the average value calculated in step (vi) as an interpolated value for display.

4,941,046

SIGNAL PROCESSING CIRCUIT FOR A MOVING DETECTION CIRCUIT WHICH INCLUDES COEFFICIENT GENERATOR WHEREIN A NUMBER OF DELAY DEVICES ARE CONNECTED IN SERIES WITH THE FIRST ONE RECEIVING THE OUTPUT OF A MOVING DETECTION CIRCUIT AND INCLUDING A TIME BASE FILTER

Hisafumi Motoe; Hiroyuki Kawashima, both of Tokyo, and Masaharu Tokuhara, Kanagawa, all of Japan, assignors to Sony Corporation, Tokyo, Japan

Filed Jul. 13, 1989, Ser. No. 379,055

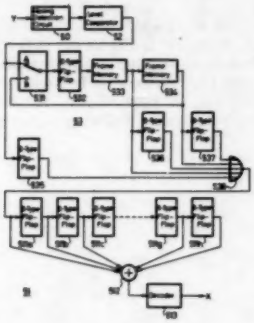
Claims priority, application Japan, Jul. 22, 1988, 63-183205; Jul. 25, 1988, 63-185169; Jul. 25, 1988, 63-185268; Jul. 27, 1988, 63-187295

Int. Cl.[5] H04N 5/217

U.S. Cl. 358—167 **11 Claims**

1. A signal processing circuit for a moving detection circuit comprising, a coefficient generator connected to an output of a moving detection circuit, characterized by said coefficient generator comprising: (a) a plurality of one bit delay devices connected in series with a first one receiving the output of said moving detection circuit, said plurality of one bit delay devices having a plurality of output terminals; (b) an adder connected

to said plurality of output terminals so as to add the output signals from said plurality of one bit delay devices, and further comprising a time base filter, said time base filter formed with a first one sampling time delay memory, first and second frame



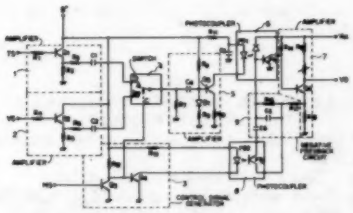
memories connected in series to said output of said first one sampling time delay memory, and switching means connected to said moving detection circuit and to an output of said second frame memory so as to selectively supply signals to the input of said one sampling time delay memory.

4,941,047

VIDEO SIGNAL COMPENSATING CIRCUIT OF A TV/VCR

Jin H. Yoon, Kyungsangbook-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Jul. 20, 1988, Ser. No. 221,751
Int. Cl.[5] H04N *5/268, 5/205, 5/91*
U.S. Cl. 358—181 **10 Claims**



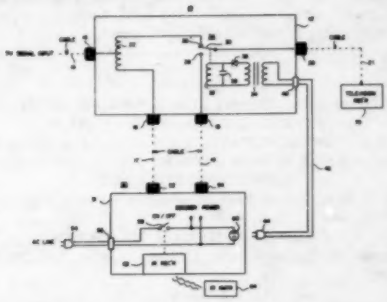
1. A video signal compensating circuit for a TV/VCR comprising a first amplifier means for amplifying a TV video signal, a second amplifier means for amplifying a VCR video signal, a control signal generator means for generating a control signal in accordance with a TV/VCR mode selection signal, a switching element for selecting and outputting one of the output signals of said first and second amplifier means in dependence upon the control signal of said control signal generator means, a third amplifier means for amplifying the output signal of said switching element, a first photocoupler for outputting a signal proportional to the output signal of said third amplifier means, an output amplifier means for amplifying the output signal of said first photocoupler, a second photocoupler connected to be turned on and off in response to the control signal of said control signal generator means, and a negative feedback element connected to vary an emitter output signal of a transistor of said output amplifier means in response to "ON" or "OFF" states of said second photocoupler and to then feedback negatively to a base of a light receiving transistor of said first photocoupler.

4,941,048

DECODER-OPERATED TELEVISION SIGNAL SWITCH

Ted E. Hartson, Scottsdale, Ariz., and Gordon E. Kelly, Algonquin, Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Dec. 14, 1988, Ser. No. 284,036
Int. Cl.[5] H04B *11/16*
U.S. Cl. 358—181 **8 Claims**



4. In combination with a television signal decoder which comprises a power supply input, a power supply output, power switching means connected between the power supply input and power supply output, a decoder signal input, and a decoder signal output;

signal switching means comprising an input connected to a source of television signals, an input connected to said decoder signal output, an output, and an actuation signal input; and

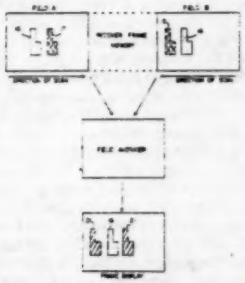
circuit means, connected between said power supply output and said actuation signal input, for providing an actuation signal to operate said signal switching means.

4,941,049

TELEVISION SYSTEM USING REVERSING SCAN WHICH MINIMIZES GHOST VISIBILITY

Richard W. Citta, Oak Park, Ill., assignor to Zenith Electronics Corporation, Glenview, Ill.

Filed Jan. 17, 1989, Ser. No. 298,394
Int. Cl.[5] H04N *7/00*
U.S. Cl. 358—187 **11 Claims**



1. A method of operating a television system for minimizing the visibility of ghost images comprising the steps of:

formatting groups of picture elements of a video scene such that during transmission successive ones of said groups are in reverse order by writing data corresponding to said groups of picture elements in a memory and reading said data from said memory to reverse the order of said successive ones of said groups of picture elements;

transmitting said groups of picture elements to a receiver; and

generating a video display at said receiver having said groups of picture elements in correct order.

10. A method of operating a television transmission system for minimizing the visibility of ghost images comprising the steps of:

developing a video signal by alternately scanning fields of a scene in opposite directions at a field rate;

transmitting said video signal to a receiver; and

receiving and generating a video display from said video signal, successive pairs of said fields being averaged for minimizing flicker of said ghost images.

4,941,050

AN AFC ARRANGEMENT FOR TUNING A TELEVISION RECEIVING APPARATUS TO A SELECT TRANSMISSION HAVING AN ACTUAL CARRIER FREQUENCY WHICH DIFFERS FROM A NOMINAL CARRIER FREQUENCY

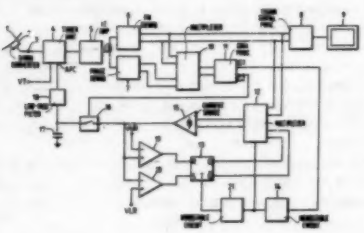
Philip H. Bird, Sidcup, England, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Apr. 14, 1989, Ser. No. 338,927

Claims priority, application United Kingdom, Apr. 27, 1988, 8809921

Int. Cl.[5] H04N 5/50

U.S. Cl. 358—195.1 13 Claims



1. Receiving apparatus for a television signal where substantially all the line periods of a frame contain a first portion comprising at least synchronizing information and a second portion comprising vision information, said apparatus comprising a tuner unit for tuning said apparatus to a selected transmission, an automatic frequency control (a.f.c.) arrangement for ensuring the correct tuning of said tuner unit, a demodulator for demodulating the signal of the selected transmission when received, means for applying a preset tuning voltage to said tuner unit for setting the tuning of said tuner unit to the nominal carrier frequency for said selected transmission, and means for applying an a.f.c. voltage from said a.f.c. arrangement to said tuner unit for correctly tuning said tuner unit to the actual carrier frequency of said selected transmission, characterized in that said a.f.c. arrangement comprises first means for causing said arrangement to operate, in the event that said tuner unit is incorrectly tuned to said selected transmission, in a first mode in which the a.f.c. voltage is such that the tuning frequency of said tuner unit is swept about said nominal frequency over a range which is greater than the expected error between the actual and the nominal carrier frequency, said frequency sweep continuing until said tuner unit is tuned sufficiently close to said actual carrier frequency that the selected transmission can be correctly decoded, whereafter second means are provided for causing said a.f.c. arrangement to operate in a second mode in which the a.f.c. voltage is derived from the output of said demodulator from said selected transmission during the first portion of the line periods, wherein said a.f.c. voltage is produced across an a.f.c. capacitor, and wherein the first means of said a.f.c. arrangement comprises a current source whose output is continuously connected, in said first mode, to said a.f.c. capacitor, a bistable circuit coupled to said current source which, in a first state, causes said source to generate a current in a first direction and, in a second state, causes said source to generate current in a second opposite direction, and sensing means connected to the output of said current source for changing the state of said bistable circuit when the current generated by said source reaches a first limit value in said first direction, and a second limit value in said second opposite direction.

4,941,051

SIGNAL PROCESSING CIRCUIT AND METHOD

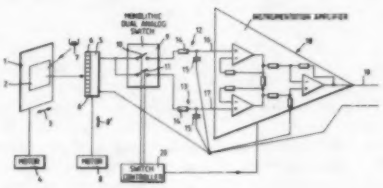
Michael E. Hicks, Hertfordshire, England, assignor to Crossfield Electronics Limited, London, England

Filed Jan. 30, 1989, Ser. No. 302,873

Claims priority, application United Kingdom, Feb. 3, 1988, 8802381

Int. Cl.[5] H04N 3/14

U.S. Cl. 358—213.16 11 Claims



1. A method of processing output signals from a radiation sensing assembly which generates, for each of a succession of sampling periods, output signals representing respectively a reference level and a radiation level related to the radiation incident on a sensor of said assembly during each respective sampling period, the method comprising performing in real time the steps of filtering a plurality of successive reference level signals and the corresponding plurality of successive radiation signals associated with said plurality of reference level signals to minimise high frequency noise effects on the signals so as to generate filtered and averaged reference level and radiation level signals; and generating a signal related to the difference between said filtered reference level and filtered radiation level signals.

4,941,052

IMAGE SIGNAL PROCESSOR WITH NOISE ELIMINATION CIRCUIT

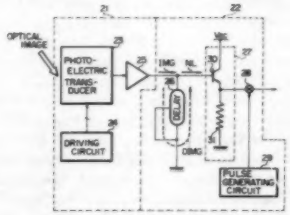
Masahiro Ohbo, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Feb. 15, 1989, Ser. No. 310,620

Claims priority, application Japan, Feb. 16, 1988, 63-34518

Int. Cl.[5] H04N 3/14, 5/14

U.S. Cl. 358—213.15 6 Claims



1. An image signal processor for an optical image capable of being divided into a plurality of small parts, comprising:

(a) a charge coupled device operative to produce a series of electric image signals each occupying a time frame and divided into a resetting section for discharging electric charges accumulated in the previous time frame, a feed

through section for newly accumulating electric charges and a data section indicative of the intensity of each small part of said optical image, said feed through section having a voltage level approximately equal to a basic level; and

(b) a noise eliminating circuit having

(b-1) a delay line coupled at the input node thereof to an output node of said charge coupled device and at the output node thereof to a constant voltage node and operative to produce a series of delayed electric image signals inverted in waveform with respect to said basic level, a time interval between each electric image signal and each delayed electric image signal being selected in such a manner that the data section of each electric signal is merged into the feed through section of each delayed electric image signal for producing a noise eliminated electric image signal,

(b-2) a single input amplifier circuit coupled between a source of voltage level and said constant voltage node and having an input node coupled to the input node of said delay line for amplifying said noise eliminated electric image signal,

(b-3) a pulse generating circuit operative to produce a periodical transfer signal, and

(b-4) gate means responsive to the periodical transfer signal and shifted between an on state and an off state for transferring a part of the data section of each noise eliminated electric image signal.

4,941,053

PREDICTIVE ENCODER FOR STILL PICTURES

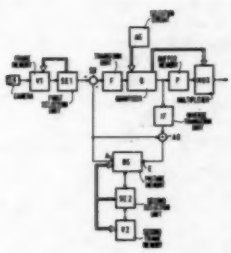
Klaus Hienerwadel, and Gerald Weth, both of Nuremberg, Fed. Rep. of Germany, assignors to U.S. Philips Corp., New York, N.Y.

Filed Apr. 5, 1989, Ser. No. 333,484

Claims priority, application Fed. Rep. of Germany, Apr. 6, 1988, 3811536

Int. Cl.[5] H04N *1/417*

U.S. Cl. 358—261.2 **3 Claims**



1. A predictive encoder for still pictures, comprising: a quantizer whose characteristic curve is variable, an output buffer from which the encoded picture date are read and transmitted at a constant bit rate, and a subtractor and a picture memory for obtaining prediction values, characterized by;

a first frame memory in which the data of all pixels of the still picture to be transmitted are stored,

a selection circuit adjusting the characteristic curve after the quantizer performs the quantizing operation,

at least an initial encoding and transmission of all data stored in the first frame memory occurring, and for each further encoding and transmission the selection circuit selecting a characteristic curve corresponding to a more refined quantizing operation.

4,941,054

COLOR-DIFFERENCE LINE-SEQUENTIAL SIGNAL PROCESSING APPARATUS

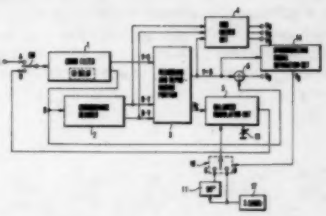
Tomotaka Muramoto, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 111,456, Oct. 21, 1987, abandoned. This application Aug. 10, 1989, Ser. No. 392,091

Claims priority, application Japan, Oct. 27, 1986, 61-253698

Int. Cl.[5] H04N *5/76*

U.S. Cl. 358—310 **17 Claims**



10. A composite color video signal processing apparatus for processing a color video signal composed of a frequency-multiplexed luminance signal and chrominance signal comprising:

(A) separating means for receiving said composite color video signal, separating the luminance signal and the chrominance signal from the received composite video signal and outputting these signals, said separating means including a delay circuit for applying a delay of one horizontal scanning period to the received signal;

(B) signal processing means for receiving the chrominance signal separated by said separating means, converting the received chrominance signal into a color-difference line-sequential signal, and then processing and outputting same;

(C) supply means for supplying the color-difference line-sequential signal outputted and processed by said signal processing means to the delay circuit included in said separating means.

4,941,055

RECORDING APPARATUS WITH IMPROVED S/N RATIO

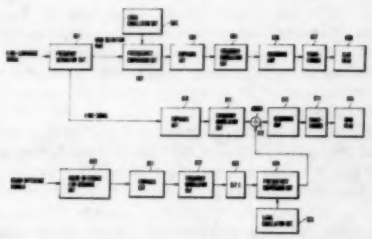
Ryo Fujimoto, Kanagawa, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Dec. 8, 1987, Ser. No. 129,991

Claims priority, application Japan, Dec. 9, 1986, 61-291495; Dec. 9, 1986, 61-291496; Dec. 9, 1986, 61-291497

Int. Cl.[5] H04N *5/782*

U.S. Cl. 358—340 **14 Claims**



1. An information signal recording apparatus for recording an information signal having a predetermined frequency band on a magnetic recording medium, comprising:

(a) signal separating means for receiving said information signal and for separating the received information signal into a first signal having a first frequency band and a second signal having a second frequency band which is higher than said first frequency band and outputting said first and second signals;

(b) first recording means having a first magnetic head to record the first signal outputted from said signal separating means onto a first area of said magnetic recording medium by said first magnetic head; and

(c) second recording means having a second magnetic head, which is different in its azimuth angle of gap from said first magnetic head, to record the second signal outputted from said signal separating means onto a second area of said magnetic recording medium, which is different from said first area.

4,941,056

A METHOD FOR OBTAINING DATA FROM AN ORIGINAL DOCUMENT USING A CAMERA SUPPORTED OR AN AIR CUSHION

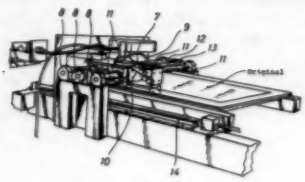
Hans Hemmingsen, Birkerod; Lars S. Christensen, Helsinge, and Kristian B. Monnike, Allerod, all of Denmark, assignors to Eskofot A/S, Ballerup, Denmark

Filed Nov. 21, 1988, Ser. No. 273,985

Claims priority, application Denmark, Nov. 24, 1987, 6177/87

Int. Cl.[5] H04N *1/10*

U.S. Cl. 358—497 **8 Claims**



1. A method for obtaining digital data from an original, comprising:

(a) providing an original supported on a bed so as to have a substantially horizontal, upwardly presenting surface from which data may be read;

(b) providing a semiconductor camera comprising a plurality of semiconductor elements arranged in a series which is less broad and less long than said original;

(c) providing a portal device movably supported on said bed for movement longitudinally of the original, the portal device being comparable in breadth to the original;

(d) mounting the camera to the portal device for movement transversally of the portal device and for vertical movement relative to the portal device towards and away from the original;

(e) while supporting said camera on a cushion of pressurized air issuing from adjacent the camera towards said surface, so that the camera floats above said surface by an amount which is dependent upon the pressure of said pressurized air in said cushion, moving said camera transversally of said original along said portal device while operating said camera to examine a respective strip of said original, and thereby acquire data therefrom; and

(f) moving said portal device longitudinally of the document to vertical juxtaposition with a respective longitudinally successive strip of said original and repeating step (e).

4,941,057

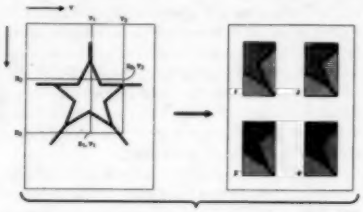
DIGITAL IMAGE PROOFING

Donald R. Lehmbeck; Roger L. Triplett, both of Penfield, and Kevin E. Marks, Rochester, all of N.Y., assignors to Xerox Corporation, Stamford, Conn.

Filed Oct. 24, 1988, Ser. No. 261,959

Int. Cl.[5] H04N *1/46*

U.S. Cl. 358—443 **14 Claims**



11. An image processing arrangement for producing a proof image demonstrating the effect of each of a plurality of filter functions on a single page of output, said arrangement comprising:

means for supplying image data;

means for selectively defining an area of interest within said image data;

means for forming proof image data from said image data, composed of repetitions of said selected area of interest;

a filter device for applying a filter function to image data;

a filter memory for storing a filter function for use in the filter device;

a filter storage storing a plurality of filter functions for said filter memory; and

a controller for selectively storing selected filter functions of said plurality of filter functions to said filter memory to apply at said filter device each of said selected plurality of filters to each repetition of said area of interest in said proof image data.

4,941,058

DATA SIGNAL RECORDING/REPRODUCTION APPARATUS OF A VCR

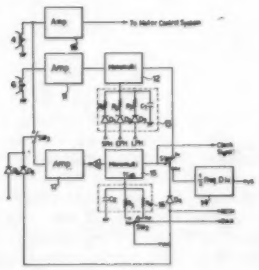
Dong Kil Jeong, Kyungki-Do, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea

Filed Aug. 31, 1988, Ser. No. 238,858

Claims priority, application Rep. of Korea, Aug. 31, 1987, 14809/1987

Int. Cl.[5] G11B *5/02*

U.S. Cl. 360—67 **1 Claim**



1. A data signal recording/reproduction apparatus for a video cassette recorder, comprising:

first amplifier means for amplifying a control signal repro-

duced by a control signal recording/reproduction head and for outputting the amplified signal to a motor control system;

auxiliary reproduction head means for tracing a control track of a video tape prior to said control signal recording-/reproduction head;

second amplifier means for amplifying the control signal reproduced by said auxiliary reproduction head;

first monostable multivibrator means for converting an output signal of said second amplifier means into a pulse signal;

first time constant circuit means for applying various trigger signals having various time constants which are different from each other according to respective SP, EP and LP modes to said first monostable multivibrator means;

first electronic switch means for selecting either an output signal of said first monostable multivibrator means or a vertical signal divided into a half frequency by a half frequency divider according to a recording control signal;

second monostable multivibrator means for converting the selected signal of said first electronic switch means into a pulse signal;

second time constant circuit for applying trigger signals having different time constants according to a data signal to said second monostable multivibrator means;

third amplifier means for amplifying a signal outputted from said second monostable multivibrator means and inverted by an inverter; and

second electronic switch means for selecting either an output signal of said third amplifier according to said recording control signal or a data recording control signal and for applying the selected output signal to said control signal record/reproduction head and third amplifier means.

4,941,059

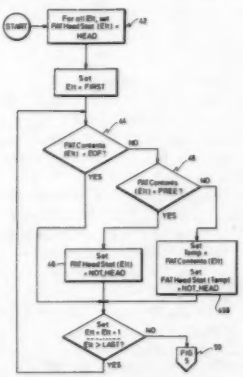
METHOD FOR RESTORING COMPUTER FILES, INCLUDING IMPROVED STEPS FOR LOCATION OF HEAD CLUSTERS OF FILES

David L. Grant, Houston, Tex., assignor to Compaq Computer Corporation, Houston, Tex.

Filed Sep. 13, 1988, Ser. No. 243,784

Int. Cl.[5] G06F *1/00*

U.S. Cl. 360—72.2 **1 Claim**



1. A method for determining which ones of a plurality of disk clusters comprise the respective head clusters of one or more not necessarily contiguous file sequence of said disk clusters,

each said file sequence being mapped in a File Allocation Table (FAT) having a plurality of elements each corresponding to one of said disk clusters, wherein the respective value of each said element in said FAT is (i) FREE, or (ii) EOF, or (iii) a pointer to a next element corresponding to a next cluster in a one of said file sequences,

said method comprising the steps of:

(a) initializing a Head Status array, said Head Status array having the same number of elements as said FAT, to indicate that each element of said FAT corresponds to a head cluster;

(b) for each element of said FAT that is FREE, indicating in said Head Status array that the disk cluster corresponding to said element is not a head cluster; and

(c) for each element of said FAT that is a said pointer to a said next element, indicating in said Head Status array that the disk cluster corresponding to said next element is not a head cluster.

4,941,060

RECORDING AND/OR REPRODUCING APPARATUS UTILIZING RECORD BEARING MEDIA OF THE DISC TYPE

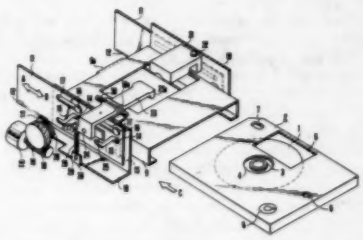
Tsukasa Uehara, Tokyo, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 201,251, May 25, 1988, abandoned, which is a continuation of Ser. No. 67,402, Jun. 24, 1987, abandoned, which is a continuation of Ser. No. 648,701, Sep. 7, 1984, abandoned. This application Dec. 5, 1988, Ser. No. 282,873

Claims priority, application Japan, Sep. 9, 1983, 58-165228

Int. Cl.[5] G11B *17/02*

U.S. Cl. 360—99.05 **35 Claims**



1. An apparatus using a disc-shaped medium, comprising:

(A) holder means for receiving the medium and movable for placing the received medium at a predetermined position for signal recording and/or reproduction;

(B) slidable means engaged with said holder means and being slidable for moving the holding means;

(C) rotating means for rotating the medium to be mounted on said rotating means;

(D) pressing means for pressing a portion of the medium to mount the medium on said rotating means; and

(E) control means for causing said pressing means to press said portion of said medium and release said pressing in response to sliding of said slidable means; wherein said slidable means moves said holder means between a first position for receiving the medium and a second position for placing the medium at said predetermined position according to the sliding thereof; and said control means controls to cause said pressing means to press said portion of the medium and thereafter release said pressing according to the sliding operation of said slidable means to move said holder means from said first position to said second position without said holder means going beyond said second position.

4,941,061

NOISE-FREE SKIP SEARCH APPARATUS UTILIZING A PIEZO-ELECTRIC ELEMENT

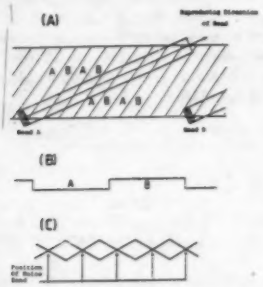
Sun K. Sung, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea

Filed Dec. 31, 1986, Ser. No. 948,158

Claims priority, application Rep. of Korea, Dec. 31, 1985, 18422/1985

Int. Cl.[5] A04N 5/783; G11B 21/10

U.S. Cl. 360—10.2 5 Claims



1. A noise-free skip search apparatus utilizing a piezo-electric element attached to and controlling the position of a rotating head relative to a recording track formed on the tape of a video tape recorder and where the tape is driven at different speeds by a capstan during a plurality of reproducing speeds comprising:

a pulse counter being reset by a signal generated in response to rotation of the capstan and being further responsive to a pulse signal generated from a clock pulse generator to provide a first pulse output signal;

a latch circuit coupled to the pulse output signal of said counter and being further responsive to said signal generated in response to rotation of the capstan for generating a latched pulse signal;

a signal subtractor circuit having a first or comparison input terminal, a second or reference input terminal, a difference output terminal, and sign bit output terminal;

a preset pulse counter operative in response to a reproducing speed mode select signal to generate a second pulse output signal having a constant count output;

said latched pulse signal and said second pulse output signal being respectively coupled to said first and second input terminals of said subtractor which in turn generates a pulse difference output signal at said difference output terminal and a signal at said sign bit output terminal of a first and second binary signal level for first and second reproducing speeds;

circuit means coupled to said subtractor for generating a first analog output signal corresponding to said pulse difference output signal;

a driver circuit for said piezo-electric element generating a position control signal coupled to said piezo-electric element from an output terminal and having a pair of input terminals, an enabling signal input terminal, a reset input terminal, a forward/reverse direction input terminal;

circuit means coupled to said preset pulse counter for generating a second analog output signal corresponding to said second pulse output;

circuit means coupled to said second analog output signal for generating an analog reference signal;

said analog reference signal being coupled to one of said pair of input terminals of said driver circuit and said first analog output signal being coupled to the other of said pair of input terminals, said driver circuit comparing said analog signals and generating said position control signal in response thereto when a reset signal is applied to said reset input terminal following an enabling signal being applied to said enabling signal input terminal and a directional input signal being applied to said forward/reverse direction input terminal.

4,941,062

MAGNETIC HEAD POSITIONING MECHANISM FOR MAGNETIC DISK DEVICE

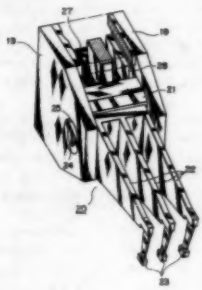
Koichi Yoshioka, Hyogo, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Oct. 28, 1988, Ser. No. 263,909

Claims priority, application Japan, Nov. 17, 1987, 62-291324

Int. Cl.[5] G11B 5/55

U.S. Cl. 360—106 11 Claims



1. A magnetic head positioning mechanism for a magnetic disk device having a pivot mechanism which comprises a pivot shaft supported within a housing, a carriage swingably supported by said pivot shaft, head-arms fixed to said carriage at base ends thereof and having attached magnetic heads at tip ends thereof, and a driving portion provided on the opposite end of said carriage with the pivot shaft support being located between the tip ends and the driving portion;

wherein the portion of said carriage positioned at the rotational center of said pivot mechanism and including the entire pivot shaft support area of said carriage is made of materials having higher specific gravity than said head-arms.

4,941,063

TELEPHONE LINES OVERVOLTAGE PROTECTION APPARATUS

Thomas McCartney, Bannockburn, and Melvin A. Lace, Prospect Heights, both of Ill., assignors to Oneac Corporation, Libertyville, Ill.

Continuation-in-part of Ser. No. 164,244, Mar. 4, 1988, abandoned. This application Apr. 20, 1989, Ser. No. 341,771

The portion of the term of this patent subsequent to Jul. 19, 2005, has been disclaimed.

Int. Cl.[5] H02H 9/04

U.S. Cl. 361—119 13 Claims

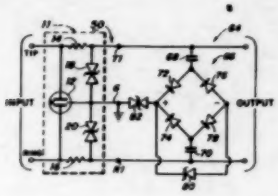
1. An overvoltage protection circuit used with a pair of telephone lines comprising:

first voltage clamping means for clamping voltage signals on said lines at a first predetermined voltage potential,

second voltage clamping means for clamping voltage signals on said lines at a second predetermined voltage potential, said second voltage clamping means including filter means for filtering noise and transient signals from said voltage signals only when said voltage signals exceed said second predetermined voltage potential,

said second voltage clamping means including a diode bridge coupled to said lines, a pair of transient voltage suppressor devices, said transient voltage suppressor de-

vices being coupled between a first and second center connection of said diode bridge and ground, and said filter means including resistance means connected in series



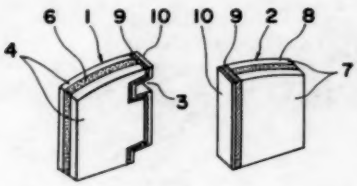
between said lines and said diode bridge and capacitance means connected between said transient voltage suppressor devices and said diode bridge center connection.

4,941,064

MAGNETIC HEAD HAVING A PAIR OF CORES IN WHICH THE OPPOSING SURFACES THEREOF ARE COATED WITH A NON-MAGNETIC LAYER AND A LOW MELTING POINT GLASS LAYER

Takeshi Tottori, Toride; Hideo Fujiwara, and Osamu Inagoya, both of Ibaragi, all of Japan, assignors to Hitachi Maxell, Ltd., Osaka, Japan

Continuation of Ser. No. 841,787, Mar. 20, 1986, abandoned. This application May 26, 1988, Ser. No. 201,397
Claims priority, application Japan, Mar. 20, 1985, 60-54119
Int. Cl.[5] G11B *5/235, 5/265, 5/31*
U.S. Cl. 360—120 **5 Claims**



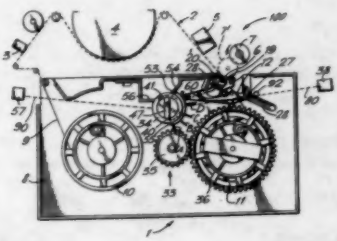
1. A magnetic head comprising a first core half and a second core half, wherein each of said core halves comprises two core bases having an amorphous metallic magnetic thin layer sandwiched therebetween, said amorphous metallic magnetic thin layer having a high saturation magnetic flux density, at least one non-magnetic thin layer comprising SiO_2 formed on facing surfaces of each respective core half and a thin layer of a low melting point glass composition comprising PbO as the main component formed on said respective non-magnetic thin layer of each of said core halves, said first core half and said second core half being bonded together at said facing surfaces so as to define a magnetic gap of less than 0.5 μm at said facing surfaces of said magnetic head, said amorphous metallic thin layer being disposed so as to form a magnetic circuit of said magnetic head, said non-magnetic thin layer being substantially chemically non-reactive with said amorphous metallic magnetic thin layer component of the respective core half and said low melting point glass thin layer, and said low melting point glass thin layer glass composition has a melting point temperature which is lower than the crystallization temperature of said amorphous metallic magnetic thin layer, the thickness of said low melting point glass thin layer ranging from 3/5 to 1/6 the thickness of said non-magnetic thin layer.

4,941,065

APPARATUS FOR CLEANING A VIDEO PLAYER/RECORDER

Joseph F. Fritsch, Dublin, Ireland, assignor to Ryan Plastics Ireland Limited, Waterford, Ireland

Filed Mar. 7, 1985, Ser. No. 709,049
Claims priority, application Ireland, Mar. 9, 1984, 599/84
The portion of the term of this patent subsequent to May 10, 2005, has been disclaimed.
Int. Cl.[5] G11B *5/41*
U.S. Cl. 360—128 **23 Claims**



1. A cleaning apparatus for cleaning operating components of a video player/recorder (100) characterized in that said cleaning apparatus includes a cassette housing (8), a cleaning ribbon (9) mounted in the cassette housing (8), a capstan and pinch roller cleaning device (12) mounted in the cassette housing (8) and having a cleaning pad means including a pair of cleaning surfaces (19,20) adapted to, in use, engage with a pinch roller (7) and capstan (6) of the video player/recorder (100) in cleaning engagement therewith and arranged such that the cleaning ribbon (9) is engaged by the capstan (6) and pinch roller (8) in its path along a lengthwise axis (2) of the cleaning ribbon (9) and the capstan 6 is located between the cleaning ribbon (9) and one of the cleaning surfaces (20).

13. A cleaning apparatus for cleaning operating components of a video player/recorder characterized in that said cleaning apparatus includes a cassette housing (8), a cleaning ribbon (9) mounted in the cassette housing (8), a capstan and pinch roller cleaning device (12) mounted in the cassette housing (8) and having a cleaning pad means including a pair of cleaning members (19, 20) adapted to, in use, engage with a pinch roller (7) and capstan (6) of the video player/recorder (100) in cleaning engagement therewith and arranged such that the cleaning ribbon (9) mounted in said cassette housing is engaged by the capstan (6) and pinch roller (7) in its path along a lengthwise axis (2) of the cleaning ribbon (9) and the cleaning ribbon (9) is positioned between the cleaning members (19, 20).

4,941,066

INJECTION MOLDED CENTER CORE FOR A RECORDING DISC AND RELATED METHOD OF MANUFACTURE

Stephen G. Swinburne, Scarborough; Anthony L. Gelardi, Cape Porpoise, both of Me., and William Stiles, Renton, Wash., assignors to Shape Inc., Biddeford, Mass.

Filed May 11, 1988, Ser. No. 192,772
Int. Cl.[5] G11B *23/03*
U.S. Cl. 360—133 **7 Claims**

1. A recording disc, comprising:

(a) a flexible recording media having first, lower and second, upper opposing planar surfaces and a central opening formed therein;

(b) a plastic center core having a first, upper planar surface and a second, lower opposing planar surface, the first and second surfaces being separated by a hub having a first diameter, being positioned in the central opening and abutting the first, lower surface of the media;

(c) a planar metal insert having a second, smaller diameter and being located on the first, upper planar surface of the center core; and

(d) a plastic ring abutting the second, upper surface of the media and being connected to the hub of the center core.

4,941,067

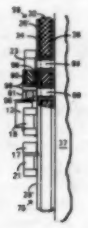
THERMAL SHUNT FOR ELECTRONIC CIRCUITS

Scott Craft, Phoenix, Ariz., assignor to Motorola Inc., Schaumburg, Ill.

Filed Apr. 7, 1989, Ser. No. 334,409

Int. Cl.[5] H05H *7/20*

U.S. Cl. 361—386 **17 Claims**



1. An electronic assembly comprising:

an insulating substrate having first and second metal layers on first and second opposed surfaces, respectively, wherein the first metal layer comprises multiple spaced-apart portions;

a power dissipating component having a first region attached to a first portion of the first layer and a second region coupled to a second portion of the first layer; and

an electrically insulating thermally conductive heat shunt component extending from the first portion of the first layer to a third portion of the first layer in thermal contact with the second layer.

4,941,068

PORTABLE ION GENERATOR

Manfred Hofmann, Bayreuth, Fed. Rep. of Germany, assignor to Hofmann & Voelkel GmbH, Bayreuth, Fed. Rep. of Germany

Filed Aug. 1, 1988, Ser. No. 226,750

Claims priority, application Fed. Rep. of Germany, Mar. 10, 1988, 3807940

Int. Cl.[5] H01T *23/00*; A61N *1/44*

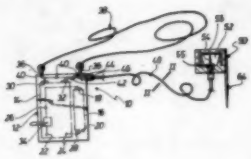
U.S. Cl. 361—231 **28 Claims**

1. A portable ion generator comprising:

a housing, a high tension source disposed in the housing and having first and second connections;

a carrier member separated in space from said housing, said carrier member being in the form of a decorative or ornamental member being essentially comprised of a fixing element for fastening the carrier member on an article of clothing of the person using the ion generator, a high tension needle electrode carried by said carrier member and a counterelectrode carried by said carrier member and arranged in spaced apart relationship from said high tension needle electrode;

first and second electrical conductor elements respectively connecting said needle electrode and said counterelectrode to said first and second connections of said high tension source; and



a contact element of electrically conductive material electrically conductively connected to said counterelectrode and mechanically connected with the housing.

4,941,069

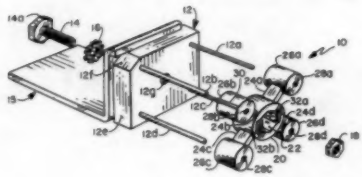
RECTIFIER SPACER/MOUNTING ASSEMBLY

Bernard Danenberg, Skokie, and Luigi Flori, Mundelein, both of Ill., assignors to Zenith Electronics Corporation, Glenview, Ill.

Filed Jul. 7, 1988, Ser. No. 216,121

Int. Cl.[5] H05K *7/20*

U.S. Cl. 361—419 **14 Claims**



1. A spacer/mounting assembly mounting to a PC board a rectifier having a housing and four conductive leads extending therefrom, said spacer/mounting assembly comprising:

a unitary body positioned on the PC board and including a first center aperture and a plurality of second outer apertures extending through said body, wherein said first center aperture has a first narrow portion and a second enlarged portion and each of said second apertures receives a respective lead of the rectifier;

first and second threaded attaching means in mutual engagement and securely mounting the rectifier to a first surface of said unitary body, wherein at least one of said first and second attaching means is disposed within said first center aperture of said body and wherein the first narrow portion of said first center aperture is disposed adjacent to the first surface of said unitary body; and

retaining means disposed within the second enlarged portion of said first aperture in said body engaging either said first or said second attaching means which is disposed within the body's first center aperture, said retaining means including a pair of locking tabs for preventing the rotation and removal of said attaching means from said body.

4,941,070

FLASH DEVICE FOR A CAMERA

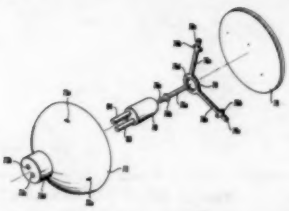
Yukio Ogawa; Kazuo Ikawa, both of Kanagawa; Toru Shoji, Tokyo; Hideo Tamamura, Kanagawa; Hiroki Nakayama, Kanagawa, and Takashi Matsushita, Kanagawa, all of Japan, assignors to Canon Kabushiki Kaisha, Tokyo, Japan

Filed Mar. 30, 1989, Ser. No. 331,013

Claims priority, application Japan, Aug. 13, 1986, 61-190037; Aug. 18, 1986, 61-192584; Aug. 18, 1986, 61-192585; Oct. 3, 1986, 61-236843; Oct. 9, 1986, 61-240719; Oct. 9, 1986, 61-240720; Oct. 9, 1986, 61-240721; Oct. 9, 1986, 61-240722; Oct. 14, 1986, 61-157478; Dec. 16, 1986, 61-194285; Dec. 17, 1986, 61-194082; Feb. 23, 1987, 62-040652; Apr. 10, 1987, 62-088101; Apr. 16, 1987, 62-094889; May 2, 1987, 62-109175; Jun. 1, 1987, 62-138801

Int. Cl.[5] G03B *15/02*; F21V *7/00*

U.S. Cl. 362—3 25 Claims



1. A flash device for a camera comprising:

(a) a light transmissive sealed body having an opening at one end thereof;

(b) sealing means for sealing the opening of said light transmissive sealed body;

(c) cathode and anode electrodes provided on said sealing means and adapted to generate a light producing arc discharged therebetween over an arc discharge route;

(d) partitioning means for expanding the art discharge route by dividing the inside of said sealed body into a plurality of chambers, and for causing light generated by said flash device to be substantially free of shadow; and

(e) means for forming a trigger electrode and for securing said trigger electrode to said light transmissive sealed body wherein said means for forming and retaining comprises a trigger leaf spring.

4,941,071

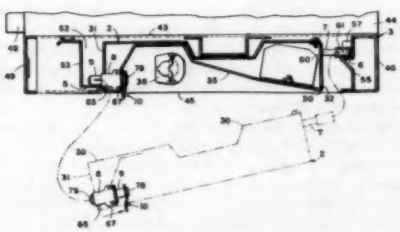
QUICK MOUNTING ARRANGEMENT FOR LIGHT FIXTURES IN OVERHEAD CABINETS AND THE LIKE

Marvin C. Knauf, Conklin, Mich., assignor to Steelcase, Inc., Grand Rapids, Mich.

Filed Feb. 7, 1989, Ser. No. 307,683

Int. Cl.[5] A47B *23/06*

U.S. Cl. 362—133 18 Claims



1. In combination, a furniture article of the type having an overhead storage unit, a light fixture, and a mounting arrangement detachably mounting said light fixture in said furniture unit under said overhead storage unit, said mounting arrangement comprising:

a front mounting ledge positioned in a lower portion of said overhead storage unit, and facing generally rearwardly;

a rear mounting ledge positioned in the lower portion of said overhead storage unit, and facing generally forwardly;

at least two mounting pins fastened to said light fixture, and protruding generally outward from a first side thereof; said mounting pins being shaped for abutting support on one of said front and rear mounting ledges;

at least one spring loaded latch mounted in said light fixture, and including a longitudinally shiftable slide pin selectively protruding from a second side thereof; said slide pin having a spring connected therewith to resiliently retain the same in a fully extended position for abutting support on the other of said front and rear mounting ledges, and a tab connected therewith to manually shift said slide pin from the fully extended position to a fully retracted position to clear the other of said front and rear mounting ledges, whereby said light fixture is mounted in said overhead cabinet by positioning said mounting pins on said one of said front and rear mounting ledges, grasping said tab and manually shifting said slide pin to the fully retracted position, pivoting the second side of said light fixture upwardly into the lower portion of said overhead storage unit, and releasing said slide pin, such that said spring extends said slide pin into the fully extended position to engage said other of said front and rear mounting ledges, and thereby securely mount said light fixture in said overhead storage unit without requiring any tools.

4,941,072

LINEAR LIGHT SOURCE

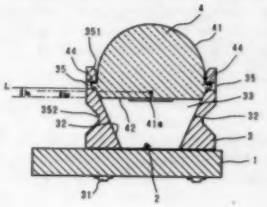
Masami Yasumoto; Tatsuya Motofke, and Toshiyuki Sawasa, all of Tottori, Japan, assignors to Sanyo Electric Co., Ltd., Osaka and Tottori Sanyo Electric Co., Ltd., Tottori, both of, Japan

Filed Apr. 7, 1989, Ser. No. 335,188

Claims priority, application Japan, Apr. 8, 1988, 63-87911; Jul. 27, 1988, 63-187731

Int. Cl.[5] F21V *21/00*, *5/04*

U.S. Cl. 362—249 19 Claims



1. A linear light source, comprising:

a substrate,

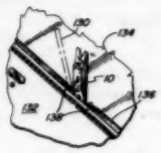
a plurality of light emitting diodes placed on said substrate in line,

a frame member provided with side walls along said line of a plurality of light emitting diodes and mounted on said substrate, said side walls having top portions which face away from said substrate and which are further from said substrate than are other portions of said side walls that are between said top portions and said substrate, and

a rod lens made of resin having a crest line parallel to said line of said plurality of light emitting diodes, said rod lens being mounted on said frame member so as to be positioned opposite to said light emitting diodes, said rod lens and said side walls having a plurality of interengaging members which are interengaged with each other, said

rod lens also having a plurality of wing members in contact with the top portions of the side walls of said frame member, said rod lens having a surface facing said substrate, said wing members including a pair of wing members extending outward in opposite directions from each other and away from said surface so that said top portions are between said wing members and said substrate and free of being between said surface and said substrate.

4,941,073
WEDGE SHAPED FLASHLIGHT
Ronald R. Bolton, 2526 Jacaranda, Orange, Calif. 92667
Filed Oct. 24, 1989, Ser. No. 426,013
Int. Cl.[5] B60Q *1/00*
U.S. Cl. 362—80.1 **15 Claims**



1. A combination wedge and flashlight apparatus for the illumination of the inside of a vehicle door, said combination wedge and flashlight apparatus comprising:

a. An apparatus body formed having at least one wedge-shaped end region with a knife-edge, said wedge-shaped region having a recess formed into said body from said knife-edge, said body being shaped for enabling the insertion of said wedge-shaped region downwardly between lower, outside regions of a closed window of a vehicle door and an exterior rain seal thereof so as to create a gap between the window and the rain seal through which the interior of the door can be seen; and

b. Flashlight means disposed in said body, said flashlight means including a flashlight bulb and means enabling said bulb to extend into an aperture in said body in said recessed region, thereby enabling a beam of light from said flashlight bulb to be directed generally toward said knife-edge when said flashlight means are energized and thereby into the inside of a vehicle door into which the body is inserted for the illumination thereof.

4,941,074
LIGHT BOXES
Gary A. DeCosse, St. Paul, and William B. Wulff, Inver Grove Heights, both of Minn., assignors to Road Rescue, Inc., Minn.
Filed Dec. 29, 1988, Ser. No. 291,625
Int. Cl.[5] F21V *7/04*
U.S. Cl. 362—61 **14 Claims**

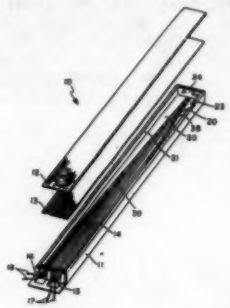
1. An ambulance for transporting patients comprising:

a motor vehicle;

an ambulance body mounted on said motor vehicle to transport a patient, said ambulance body having an interior with a ceiling and a patient cot area;

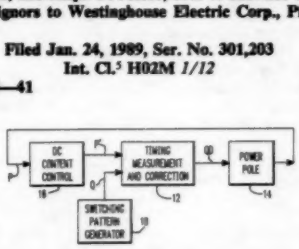
a plurality of light boxes, each having a first end and a second end, each of said light boxes including an interior region having interior surfaces, a white reflective surface extending over said interior surfaces, each of said light boxes having a source of light, said plurality of light boxes mounted on said ceiling to thereby provide light to the patient cot area in the interior of said ambulance body, each of said light boxes extending substantially across said ambulance body, each of said light boxes having a high light reflecting film extending along a portion of said white reflective surface, said high light reflecting film extending away from said source of light, said high light reflecting film comprising a general triangular shape that converges from said first end to said second end to thereby provide greater light reflection in the area proximate said source of light; and

each of said plurality of light boxes having a panel extending along said light boxes, said panels extending over said



interior region of each of said light boxes, said panel permitting light to leak from said interior region through said panel to thereby provide light to the patient cot area on the interior of said ambulance body whereby said light illumination from said plurality of light boxes is at least 35 to 40 foot candles over at least 90% of said patient cot area.

4,941,075
TIMING CORRECTION FOR SQUARE WAVE INVERTER POWER POLES
David A. Fox, and Ralph D. Jessee, both of Shawnee Township, Ohio, assignors to Westinghouse Electric Corp., Pittsburgh, Pa.
Filed Jan. 24, 1989, Ser. No. 301,203
Int. Cl.[5] H02M *1/12*
U.S. Cl. 363—41 **6 Claims**



5. A circuit for controlling the operation of solid state switching devices in an output stage of an electronic inverter, said circuit comprising:

means for producing a first switching command signal;

a first counter for counting a plurality of clock pulses, said counter beginning to count said pulses in response to a transition point in said first switching command signal;

means for producing a first switch drive signal having transition points occurring when said first counter reaches a predetermined count;

a first solid state switching device, said first solid state switching device changing conduction state in response to the transition points in said first switch drive signal;

means for producing a first switch operation signal having transition points occurring in response to a change in the conduction state of said first solid state switching device;

means for producing a modified first switch operation signal by time shifting the transition points of said first switch operation signal by an amount corresponding to the level of DC voltage produced by said inverter; and

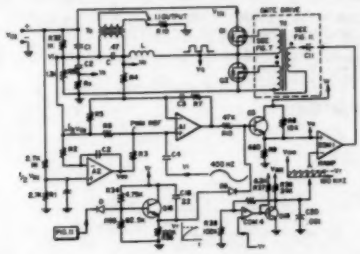
wherein said first counter stops in response to one of said transition points in said modified first switch operation signal.

4,941,076

START-UP CIRCUIT FOR A HIGH VOLTAGE DC TO AC CONVERTER

Bonifacio Diaz, El Paso, Tex., assignor to Zenith Electronics Corporation, Glenview, Ill.

Division of Ser. No. 256,872, Oct. 12, 1988, Pat. No. 4,872,100.
This application Jun. 30, 1989, Ser. No. 374,689
Int. Cl.[5] H02M 7/5375
U.S. Cl. 363—49 17 Claims



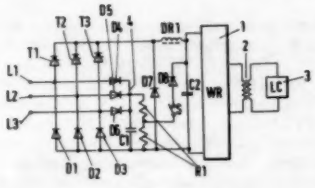
1. A high voltage converter, comprising:
(a) switching means, adapted to be disposed across a power supply, for switching current to and from a common node;
(b) two capacitors in series with each other at a junction and across said power supply;
(c) series capacitor and inductor means for joining the common junction between said two capacitors to said common node and for producing a high voltage sinusoidal waveform output;
(d) control means, comparing the voltage at said junction to a half-voltage derived across said power supply, for providing an output for operating said switching means to produce a predetermined voltage across said series capacitor; and
(e) starting means for slowly starting said control means such that the initial duty cycle will be approximately fifty percent and then increase or decrease according to the voltage at said junction.

4,941,077

CONFIGURATION FOR STARTING AN INVERTER

Jan Fabianowski, Dortmund, and Robert Ibach, Schwerte, both of Fed. Rep. of Germany, assignors to Asea Brown Boveri Aktiengesellschaft, Mannheim, Fed. Rep. of Germany

Filed Oct. 17, 1989, Ser. No. 422,645
Claims priority, application Fed. Rep. of Germany, Oct. 21, 1988, 3835869
Int. Cl.[5] H02M 5/48
U.S. Cl. 363—49 3 Claims



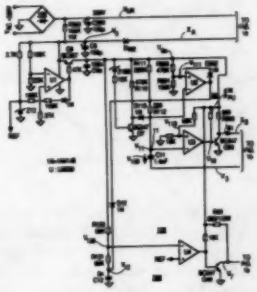
1. Configuration for starting an inverter, comprising a half-controlled 3-phase bridge including thyristors and diodes, an overvoltage protector connected to said half-controlled 3-phase bridge including additional diodes and a capacitor with a divided discharging resistor having a division point, an intermediate circuit including a reactor and a capacitor with positive and negative terminals, a load formed of a series-resonant circuit in the load circuit of the inverter, a transformer through which said load is fed by said intermediate circuit, a switch connected to said division point, and a diode operating in the forward direction being connected between said switch and the positive terminal of said capacitor of said intermediate-circuit.

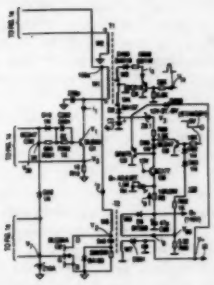
4,941,078

SYNCHRONIZED SWITCH-MODE POWER SUPPLY

Giovanni M. Leonardi, Giornico, Switzerland, assignor to RCA Licensing Corporation, Princeton, N.J.

Filed Oct. 19, 1989, Ser. No. 424,353
Claims priority, application United Kingdom, Mar. 7, 1989, 8905172; Mar. 7, 1989, 8905173
Int. Cl.[5] H02M 3/335
U.S. Cl. 363—97 24 Claims





1. A synchronized switch mode power supply, comprising:
a transformer having first and second windings;
first switching means coupled to said first winding for generating a first switching current in said first winding to periodically energize said second winding;
a source of a synchronizing input signal at a frequency that is related to a deflection frequency;
second switching means responsive to said input signal and coupled to said second winding for periodically applying a low impedance across said energized second winding that by transformer action produces a substantial increase in said first switching current;
means for generating a periodic first control signal;

means responsive to said first switching current and coupled to said first control signal generating means for sensing said increase in said first switching current to synchronize said first control signal to said input signal;

a source of an input supply voltage; and

means responsive to said first control signal and coupled to said input supply voltage for generating from said input supply voltage an output supply voltage in accordance with said first control signal.

4,941,079

PULSE WIDTH MODULATION POWER TRANSMISSION SYSTEM

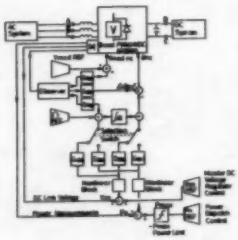
Boon Teck Ooi, Montreal, Canada, assignor to The Royal Institution for the Advancement of Learning, Quebec, Canada

Filed Feb. 13, 1989, Ser. No. 309,154

Claims priority, application Canada, Oct. 7, 1988, 579675

Int. Cl.[5] H02M *7/5387*

U.S. Cl. 363—132 **49 Claims**



1. A converter for interconnecting a first electric network and a second electric network to transmit electric power from one network to the other, each of said networks being coupled to a respective active power source, said first network including DC link terminals for coupling said first network to said converter, there being a DC voltage having a certain amplitude across the DC link terminals, said second network including AC link terminals for coupling said second network to said converter, there being an alternating voltage at a given substantially fixed frequency across said AC link terminals, said alternating voltage having an amplitude which is always lower than the amplitude of said DC voltage, said converter comprising:

a bridge of valves each associated with an antiparallel diode, each valve of said bridge being capable of assuming two different states, namely an ON staten and an OFF state, in said ON state the valve allowing current to pass therethrough, in said OFF state the valve blocking the passage of current, each diode being normally reverse-biased between said DC and alternating voltage, and said bridge being capable of operating either as an inverter to enable transmission of electric power from the first network to the second one, or as a rectifier to enable transmission of electric power from the second network to the first one;

inductor means interposed between said bridge and said AC link terminals for producing a boost voltage across said inductor means, said boost voltage forward-biasing said diodes to allow the same to conduct electric current to thereby enable operation of said bridge as an inverter and rectifier;

capacitor means across said DC link terminals, said bridge being interposed between the inductor and capacitor means;

valve control means coupled to said bridge for commanding the valves thereof to switch state to operate said bridge as an inverter or rectifier, said valve control means including:

signal generating means for outputting a control signal representative of a desired valve state switching sequence to obtain a bridge voltage waveform having a fundamental Fourier component at a frequency corresponding substantially to the frequency of said alternating voltage; and

frequency control means coupled to said signal generating means to adjust said control signal in accordance with adrift of the frequency of said alternating voltage to cause the frequency of said fundamental Fourier component to track the frequency of said alternating voltage.

4,941,080

FULL WAVE RECTIFIER CIRCUIT

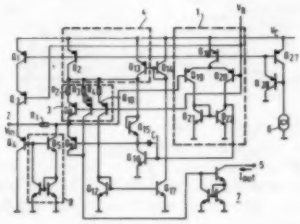
Günther H. K. O. Sieborger, Schenefeld, Fed. Rep. of Germany, assignor to U.S. Philips Corporation, New York, N.Y.

Filed Sep. 14, 1989, Ser. No. 407,375

Claims priority, application Fed. Rep. of Germany, Sep. 16, 1988, 3831454

Int. Cl.[5] G01R *19/22*; G08C *13/00*

U.S. Cl. 363—127 **12 Claims**



1. A fullwave rectifier circuit comprising; a signal input for receiving an input signal current to be rectified, means coupling said signal input to a signal output via a rectifier stage, said rectifier stage comprising a semiconductor junction for conduction of the input signal current during one half-cycle of the current and a first current mirror for mirroring the input signal current during the other half-cycle of the current to the signal output, a differential amplifier having an input coupled to the input of the rectifier stage and having its output negatively fed back via a driver stage to the input of the rectifier stage, and a current source for supplying the supply current of the driver stage and the first current mirror, characterized in that the current source is controllable in response to the output current of the first current mirror for supplying a current which deviates from a constant value by an amount equal to the current needed by the first current mirror.

4,941,081

INTERRUPT ZONE IN RUNG OF LADDER PROGRAM IN PROGRAMMABLE CONTROLLER

Shalabh Kumar, Kildeer, and Duane S. Edgar, Schaumburg, both of Ill., assignors to Microfast Controls Corp., Carol Stream, Ill.

Continuation-in-part of Ser. No. 46,229, May 4, 1987, Pat. No. 4,839,789. This application Dec. 31, 1987, Ser. No. 140,069

Int. Cl.[5] G06F *15/46*; G05B *19/00*

U.S. Cl. 364—140 **10 Claims**

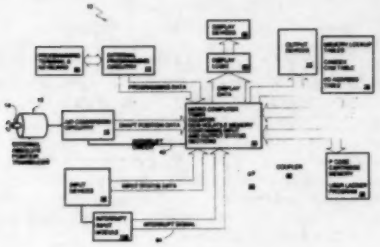
1. A programmable control device for controlling the outputs to a plurality of output devices relative to inputs and for synchronizing selected outputs with the occurrence of an external event, said control device comprising:

data processing means including memory means;

a user ladder program in said memory means;

said user ladder program having at least one interrupt zone which has a program therein that is not executed during

normal ladder program executed and which is responsive to an interrupt signal generated by the happening of an



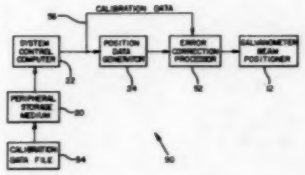
external event to provide high speed response to the happening of such external event.

4,941,082

LIGHT BEAM POSITIONING SYSTEM

Robert M. Pailthorp, Portland; Howard V. Goetz, Sherwood; Mark A. Bortnem, Newberg, and Bruce E. Edson, Beaverton, all of Oreg., assignors to Electro Scientific Industries, Inc., Portland, Oreg.

Filed Apr. 25, 1988, Ser. No. 185,414
Int. Cl.[5] G06F *15/46*; G01C *25/00*
U.S. Cl. 364—167.01 **15 Claims**



1. A light beam position error correction system employing plural optical components for directing the propagation path of the light beam in response to beam position command data, comprising:

light source means to produce a beam of light propagating along a beam path;

beam positioning means receiving the beam to direct its path of propagation toward a position on a target surface;

position data generating means receiving beam position command data to generate position coordinate signals corresponding to a preselected position on the target surface; and

error correction processing means receiving the position coordinate signals to develop compensated position coordinate signals for delivery to the beam positioning means, the compensated position coordinate signals modifying the position coordinate signals to correct for light beam positioning errors introduced by the system optical components so that the beam positioning means directs the light beam to the preselected position on the target surface, the position coordinate signals having an X signal and a Y signal that indicate the instantaneous commanded position of the light beam, and the compensated position coordinate signals include an X_c signal and a Y_c signal, the X_c signal being a function of polynomial

$$B_1X+C_1X^2+D_1X^3+E_1Y+F_1Y^2+G_1X\text{-}Y+H_1XY^2$$

and the Y_c position signal being a function of the polynomial

$$B_2Y+C_2Y^2+D_2Y^3+E_2X+F_2X^2+G_2XY+H_2YX^2,$$

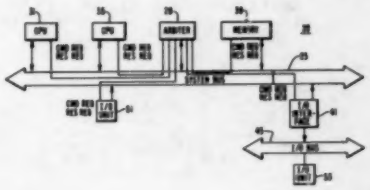
where B_1, C_1, D_1, E_1, F_1, G_1, H_1, B_2, C_2, D_2, E_2, F_2, G_2, and H_2 represent field correction coefficients of constant values that correspond to the light directing optical properties of the system components.

4,941,083

METHOD AND APPARATUS FOR INITIATING INTERLOCK READ TRANSACTIONS ON A MULTIPROCESSOR COMPUTER SYSTEM

Richard B. Gillett, Jr., Westford, and Douglas D. Williams, Pepperell, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed May 1, 1987, Ser. No. 44,486
Int. Cl.[5] G06F *13/42*
U.S. Cl. 364—200 **12 Claims**



1. Commander node apparatus for initiating exclusive read-modify-write operations on a computer system including a responder node and a synchronous pended bus, said operations having a set of distinct transactions on said synchronous pended bus including an interlock read transaction to retrieve information stored at a specified location in said responder node and restrict access to said stored information by subsequent interlock read transactions, and an unlock write transaction to store information in said specified location and restore access to said stored information; said interlock read transaction including a command transfer comprising an interlock read command arbitration initiated by a commander node to reserve bus cycles on said synchronous pended bus, an interlock read command message including an interlock read command transmitted to said responder node during bus cycles reserved by said command arbitration, and a command confirmation transmitted over said synchronous pended bus from said responder node during bus cycles reserved by said command arbitration; said interlock read transaction further including a response transfer, said response transfer comprising a response arbitration initiated by said responder node to reserve bus cycles on said synchronous pended bus, a response message transmitted from said responder node over said synchronous pended bus during bus cycles reserved by said response arbitration, and a response confirmation which is transmitted over said synchronous pended bus to said responder node during bus cycles reserved by said response arbitration, said apparatus comprising:

means for initiating, over said synchronous pended bus to said responder node containing said specified location, an interlock read command message to retrieve information from said specified location and an unlock write command message to write modified information in said specified location;

means for receiving, over said synchronous pended bus from said responder node at a predetermined time subsequent to initiation of said interlock read command message, a command confirmation corresponding to said interlock read command message; and

means for receiving from said responder node, at an unspecified time subsequent to initiation of said interlock read command, a lock status response message indicating

whether said interlock read command was executed by said responder node;

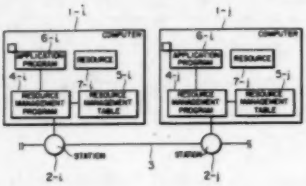
whereby said synchronous pended bus is made accessible to nodes other than said commander node apparatus and said responder node at time periods between said command transfer and said response transfer.

4,941,084

SYSTEM FOR LOCATING RESOURCES RESIDED IN A DISTRIBUTING PROCESSING SYSTEM BY SEQUENTIALLY TRANSMITTING RESOURCE INQUIRIES THROUGH A LOOPED TRANSMISSION LINE

Matsuaki Terada, Machida; Hiroshi Wataya, Hitachi; Satoru Takagi, Kawasaki, and Masao Sueki, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Continuation of Ser. No. 766,196, Aug. 16, 1985, abandoned.
This application May 27, 1988, Ser. No. 201,290
Claims priority, application Japan, Sep. 14, 1984, 59-191555
Int. Cl.[5] G06F *15/16, 13/38*
U.S. Cl. 364—200 **5 Claims**



1. A resource management system in a distributed processing system, said management system comprising:

a plurality of arithmetic processing means;

at least one resource belonging to each arithmetic processing means;

a unidirectional looped transmission line interconnecting said plurality of arithmetic processing means for exchanging information therebetween; and

storage means provided in each of said plurality of arithmetic processing means, for storing a resource management table which registers an identification code and attribute information of a resource belonging to said arithmetic processing means, said attribute information including information for specifying a location of said resource; and

a first one of said plurality of arithmetic processing means including means for effecting an inquiry through said transmission line, to all other arithmetic processing means to determine whether any one of said other arithmetic processing means contains a resource represented by an identification code desired by said first arithmetic processing means;

wherein, said inquiry being performed by sending an inquiry request from said first one of said arithmetic processing means to a second arithmetic proceeding means of said other arithmetic processing means, determining by said second arithmetic processing means whether a resource requested by said inquiry request is contained therein, and if said requested resource is not contained in said second arithmetic processing means sequentially passing said inquiry request to each of said other arithmetic processing means until said requested resource is found; and

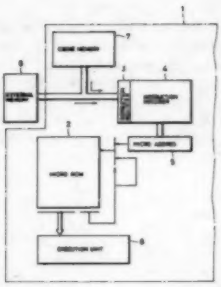
wherein each of said other arithmetic processing means includes means for making reference to the resource management table contained therein to examine whether it contains the desired resource and means for effecting a response processing to transmit, through said transmission line, an identification code and attribute information of said desired resource to said first arithmetic processing means when said reference means detects said desired resource so that said first arithmetic processing means can access said desired resource by using said attribute information.

4,941,085

DATA PROCESSING SYSTEM HAVING APPARATUS FOR INCREASING THE EXECUTION SPEED OF BIT FIELD INSTRUCTIONS

Ken Sakamura, No. 105, 12-30 Shiroganedai 3-chome, Minato-ku, Kodaira-shi, Tokyo; Takuichiro Nakazawa, Kodaira; Atsushi Hasegawa; Ikuya Kawasaki, both of Koganei, and Kazuhiko Iwasaki, Hachiohji, all of Japan, assignors to Ken Sakamura; Hitachi, Ltd. and Hitachi Microcomputer Engineering Ltd., all of Tokyo, Japan

Filed Aug. 20, 1987, Ser. No. 87,308
Claims priority, application Japan, Aug. 27, 1986, 61-198870
Int. Cl.[5] G06F *9/30, 9/308, 9/355, 12/04*
U.S. Cl. 364—200 **6 Claims**



1. A data processing system, comprising:

execution means for executing instructions, said instructions including an instruction for processing a field which contains two or more words within a memory and an instruction for processing a field which is contained within one word of said memory; and

said execution means including means for calculating a bit width of each field to be processed by said instruction to determine the number of bits in each field;

wherein said execution means, when executing an instruction, determines whether said instruction is an instruction for processing a field which is contained within one word and if said instruction is an instruction for processing a field which is contained within one word, a calculation of a bit width of said field of said instruction is omitted;

wherein said field of said instruction for processing a field contained within one word is designated by operands of a base address indicating an address as a reference, an offset value indicating a number of bits from the base address to a starting end of said field, and a field width indicating a number of bits in said field, said operands being included within said instruction for processing a field contained within one word;

wherein said instruction for processing a field contained within one word is supplied with an offset value as an immediate value by said execution means in response to an operand of said instruction;

wherein said instruction for processing a field contained within one word is supplied with a field width as an immediate value by said execution means in response to an operand of said instruction; and

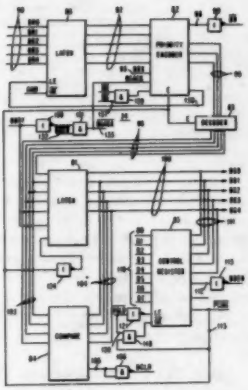
wherein said instructions are each composed of three half-words.

4,941,086

PROGRAM CONTROLLED BUS ARBITRATION FOR A DISTRIBUTED ARRAY PROCESSING SYSTEM

Thomas A. Kriz, Sandy Hook, Conn., assignor to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 2, 1984, Ser. No. 576,383
Int. Cl.[5] G06F *13/364*
U.S. Cl. 364—200 5 Claims



1. A data processing system comprising:

a bus;

a processor connected to said bus and exerting master control over the use of said bus;

a plurality of requesting devices connected to said bus, each device being operative to send a bus request signal over said bus and to receive a bus grant signal from said bus; and

hardware controlled bus arbiter means including a plurality of input lines connected to said bus for receiving bus request signals from said requesting devices, a plurality of output lines respectively connected to said bus for sending bus grant signals over said bus, and arbiting means for generating first bus grant signals, said arbiting means being responsive to a single bus request signal on one of said input lines for sending a first bus grant signal over said bus to the one of said requesting devices from which said single bus request signal was sent,

said arbiting means being further operative in response to a plurality of simultaneous bus request signals on plural ones of said input lines for sending a single first bus grant signal on said bus to grant use of said bus to one of the requesting devices, from which such simultaneous bus request signals were sent, in accordance with a predetermined priority, the improvement comprising:

storage means connected to said bus for storing a program controlling use of said bus which program includes predefined signals; and

control means connected to said bus and being responsive to said predefined signals for generating second bus grant signals on a mutually exclusive basis relative to said first bus grant signals, said second bus grant signals being transmitted over said bus to said requesting devices;

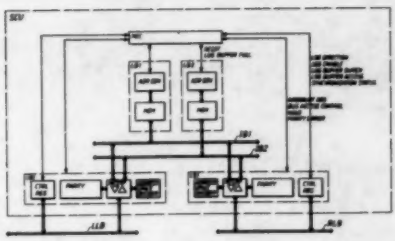
said processor being operative in response to execution of said program to transfer at least one of said predefined signals from said storage means over said bus to said control means to generate a single second bus grant signal granting use of said bus to a requesting device predetermined by such single second bus grant signal.

4,941,087

SYSTEM FOR BUMPLESS CHANGEOVER BETWEEN ACTIVE UNITS AND BACKUP UNITS BY ESTABLISHING ROLLBACK POINTS AND LOGGING WRITE AND READ OPERATIONS

Mladen Kap, Västerås, Sweden, assignor to ASEA Aktiebolag, Västerås, Sweden

Filed Sep. 18, 1987, Ser. No. 97,784
Claims priority, application Sweden, Sep. 19, 1986, 8603945
Int. Cl.[5] G06F *11/20, 11/30*
U.S. Cl. 364—200 13 Claims



9. In a computer equipment having a central unit wherein bumpless changeover of function from active units to backup units take place, the central unit having at least one active processor for handling interrupts with the aid of interrupt routines of which at least some are hardware initiated and have an entry point in which the execution of the routine is started and an interrupt acknowledgement point, the central unit further including at lenst one active memory, at least one redundant unit as a backup unit for at least one of said active units, and members for effecting changeover of the function from an active unit to a backup unit, the central unit effecting write and read operations against peripheral units included in the computer equipment, wherein the computer equipment further comprises:

(a) members for establishing successive rollback points for the active processor during program execution by storing, in at least all hardware initiated interrupt routines between the entry point and the interrupt acknowledgement point, status of the active processor and at least contents of those parts of the active memory which have been modified by the active processor;

(b) members for logging said write and read operations against the peripheral units after each rollback point;

(c) members, connected to said storing members, for returning the program execution to the last established rollback point, after changeover of the function from the active unit to the backup unit, by restoring the contents of the active memory and the status of active processor to the respective contents and status established by a corresponding unit previously active at said rollback point, and thereafter for resuming the program execution without carrying out any write and read operations against the peripheral units; and

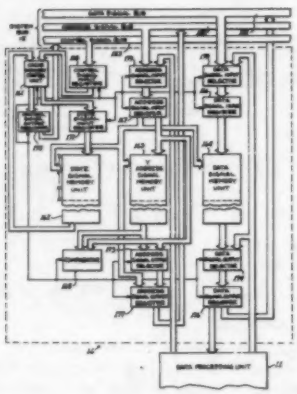
(d) members, connected to said logging members, for fetching, during the following program execution, results of read operations already performed against the peripheral units from the log until all logged operations have been repeated, and thereafter to continue the program execution while carrying out operations against the peripheral units.

4,941,088

SPLIT BUS MULTIPROCESSING SYSTEM WITH DATA TRANSFER BETWEEN MAIN MEMORY AND CACHES USING INTERLEAVING OF SUB-OPERATIONS ON SUB-BUSSES

Stephen J. Shaffer, Harvard, Mass.; Richard A. Warren, Austin, Tex.; Thomas W. Eggers, Littleton, and William D. Strecker, Harvard, both of Mass., assignors to Digital Equipment Corporation, Maynard, Mass.

Filed Feb. 5, 1985, Ser. No. 698,399
Int. Cl.[5] G06F *13/16, 13/38, 12/00*
U.S. Cl. 364—200 8 Claims



4. A data processing system comprising:

a system bus for distributing groups of logic signals throughout said data processing system, said system bus including a plurality of sub-bus units, each of said sub-bus units carrying groups of logic signals related to a preselected sub-operation implementing said distributing groups of logic signals, wherein each access to said system bus occurs during a sequence of intervals having a preselected duration, each sub-operation occurring during a one of said intervals, said sub-operation intervals of each distributing of logic signal groups occurring during system bus intervals having a preestablished relationship, wherein two distributing of logic signal operations can have interleaved sub-operations;

a main memory unit coupled to said system bus for storing a plurality of groups of logic signals, each group of logic signal identified by an address signal group, wherein said system bus includes a first sub-bus unit for transferring groups of logic signals received from said main memory unit, said main memory unit including apparatus for combining data signal groups from a second sub-bus unit and said main memory unit and applying a modified data signal group to said first sub-bus means unit in response to selected control signals, said sub-operation preestablished relationship selected to permit said combining data between a memory write sub-operation and a memory read sub-operation;

a plurality of cache memory units coupled to said system bus for storing a subset of said main memory unit groups of logic signals, said plurality of sub-bus units including an address sub-bus unit for applying address signal groups to and receiving address signal groups from said cache memory units; and

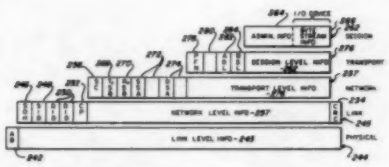
a data processing unit coupled to each of said cache memory units, said data processing unit processing groups of logic stored in said main memory unit.

4,941,089

INPUT/OUTPUT NETWORK FOR COMPUTER SYSTEM

Michael A. Fischer, San Antonio, Tex., assignor to Datapoint Corporation, San Antonio, Tex.

Filed Dec. 12, 1986, Ser. No. 941,084
Int. Cl.[5] G06F *13/38*
U.S. Cl. 364—200 30 Claims



1. In a local area network (LAN) comprising a communication medium commonly connecting a plurality of Nodes, LAN interface means at each Node for controlling access to the medium and communicating LAN packets between predetermined selected source and destination Nodes, each LAN data packet including a LAN data field and a LAN header field containing characters which control the interface means to achieve Node to Node communications in accordance with a predetermined LAN communication protocol; and in combination therewith,

a character I/O channel for communicating byte stream data and control administrative information in single IONET network level data packet messages from source to destination Devices connected at the Nodes, each Device including a device interface which connects to a device which is separate from the Device, the device being one of either an I/O device which conducts I/O data transfers or a computer device including a memory and a processor means and a program code for operating the computer device, said character I/O channel comprising:

point of use (POU) means included in the Device and connected to the LAN interface means at each Node, the POU means connected to each I/O device including a microcomputer means including a memory and a program code for operating the microcomputer means;

the program codes for the processor means and the microcomputer means defining a predetermined IONET communication protocol for communicating with Devices and their connected device interfaces and devices, the IONET communication protocol being separate from the LAN communication protocol;

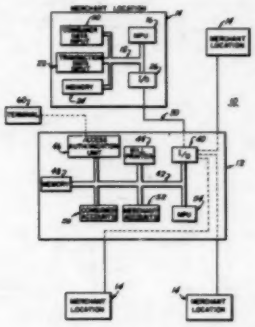
the POU means inserting characters in the data field of LAN data packets to form the IONET network level data packet messages which have an IONET header field and an administrative field and byte stream data field, the IONET header characters including a function code specifying one of a plurality of control functions, the administrative field characters including an administrative information code for use in accomplishing the specified control function to be performed by one of the Device or its device interface, the byte stream data characters originating from a device at the source Node; and

the POU means of the destination Node directly interpreting the function code and the administrative information code characters (a) to establish a session between the source and destination Devices for communicating IONET data packet messages therebetween without acceptance of and interference from other IONET data packet messages for the duration of the session, and (b) to perform a corresponding control function on one of the destination Device or its device interface during the session, while (c) simultaneously transferring the byte stream data characters in unmodified form directly to the device connected to the device interface of the destination Device.

4,941,090
CENTRALIZED CONSUMER CASH VALUE ACCUMULATION SYSTEM FOR MULTIPLE MERCHANTS

Patrick D. McCarthy, 3943 Gilman Ave., Louisville, Ky. 40207

Filed Jan. 27, 1989, Ser. No. 303,319
Int. Cl.[5] G07G 1/00
U.S. Cl. 364—405 15 Claims



9. A centralized consumer cash value system for transactions between consumers and multiple merchants comprising:

at each merchant location at least:

consumer data input means at the point-of-sale for inputting an account number unique to the customer and the consumer's birthdate;

transaction data input means for inputting the dollar amount of the point of-sale transaction;

memory means for storing a credit rate selected by the merchant;

processor means for determining a credit value based upon the dollar amount of the point-of-sale transaction and the selected credit rate; and

first communication means for transmitting to the central system the consumer's account number and birthdate, and the credit value related to each transaction; and

at a central location, a central system having at least:

second communication means for receiving the consumer's account number and birthdate, and the credit value related to each transaction;

consumer account memory means for storing cash values for a plurality of consumer accounts, each consumer account being associated with a respective, unique account number and one of a plurality of birthdates;

processor means for incrementing the cash value in a consumer account associated with a received consumer account number and birthdate by an amount corresponding to the received credit value; and

unit means for providing to each consumer having a selected birthdate access to funds in an amount based upon the cash value in the consumer account associated with that consumer.

4,941,091
MAIL MANAGEMENT SYSTEM TRANSACTION DATA CUSTOMIZING AND SCREENING

Michelle S. Brenult, Fairfield, and John H. Steinmetz, Bridgeport, both of Conn., assignors to Pitney Bowes Inc., Stamford, Conn.

Filed Jun. 30, 1987, Ser. No. 67,916
Int. Cl.[5] G06F 15/20
U.S. Cl. 364—406 22 Claims

1. A method for centrally managing a mailing system comprising the steps of:

(a) providing a plurality of computer-controlled workstations each of which is operable to originate a mailing transaction, each of said workstations having means for entering data expressive of a mailing transaction, each of said workstations further being operable for storing data fields expressive of an entered mailing transaction, said data fields including at least the following fields:

(i) account ID,

(ii) date,

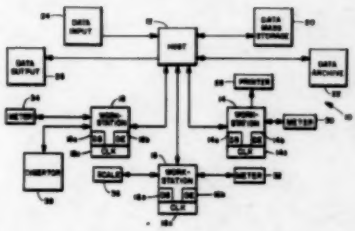
(iii) workstation ID,

(iv) dispensed postage amount,

(v) charged postage amount,

(b) coupling each of a plurality of said workstations to a postage dispensing device such that each workstation is enabled to activate the device to dispense postage and also to receive data from the device related to the dispensing of postage;

(c) coupling each of the workstations to a host data processing system such that each workstation is enabled to bidirectionally communicate data with the host system, and storing at the host system the different account IDs which



may be charged for mailing transactions made at the respective workstations;

(d) said host system specifying predetermined ones of data fields as fixed data fields which are to be included within a mailing transaction, said fixed data fields including at least items (i), (iv) and (v) in step (a);

(e) originating mailing transactions at each of said workstations and storing at each workstation, for each mailing transaction thereof, data expressive of the mailing transaction thereof including at least the data fields specified by the host system in step (d);

(f) transmitting the mail transaction data from each workstation to the host system;

(g) storing at the host system the transmitted mailing transactions data of step (f); and

(h) based on the stored transactions data of step (g) from the various workstations, allocating the cost of mailing transactions originating at said workstations among the different account I.D.'s stored at the host system.

4,941,092
SIGNAL PROCESSING METHOD FOR DETERMINING BASE SEQUENCE OF NUCLEIC ACID

Makoto Hara; Masakazu Hashiue, both of Kaisei, and Kazuyoshi Tanaka, Tokyo, all of Japan, assignors to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Filed May 23, 1986, Ser. No. 866,355
Claims priority, application Japan, May 23, 1985, 60-111185; May 23, 1985, 60-111186
The portion of the term of this patent subsequent to Jan. 19, 2005, has been disclaimed.
Int. Cl.[5] G01N 33/58; C12Q 1/68
U.S. Cl. 364—413.15 31 Claims

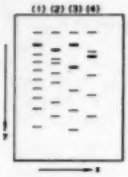
1. A signal processing method for determining base sequence of nucleic acids by subjecting digital signals to signal processing, said digital signals corresponding to an autoradiograph of plural resolved rows which are formed by resolving a mixture of base-specific DNA fragments or base-specific RNA frag-

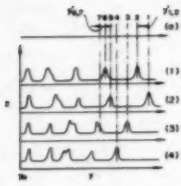
ments labeled with a radioactive element in a one-dimensional resolving direction on a support medium,

which comprises steps of:

(1) detecting at least two bands continuously in the lower part of each resolved row and numbering the bands consecutively in order from the lower end;

(2) obtaining correlation of a distance between the detected bands in the resolving direction with the band's number and predicting positions of undetected bands in the resolving direction from the correlation;





(3) detecting at least one band on the resolved rows on the basis of the predicted positions and numbering the band consecutively;

(4) obtaining the correlation of the distance between the bands with the band's number for the already detected bands including the band newly detected in the step (3), and predicting positions of undetected bands from the correlation; and

(5) repeating in order the steps (3) and (4) to thereby detect all bands on the resolved rows.

4,941,093

SURFACE EROSION USING LASERS

John Marshall, Farnborough; Anthony L. Raven, Royston; Walter T. Welford, London, and Karen M. M. Ness, Royston, all of Great Britain, assignors to Summit Technology, Inc., Mass.

Continuation-in-part of Ser. No. 869,335, Jun. 2, 1986, abandoned. This application Sep. 9, 1986, Ser. No. 905,156

Claims priority, application United Kingdom, Sep. 12, 1985, 8522630; Feb. 21, 1986, 8604405

Int. Cl.[5] A61B *17/00*

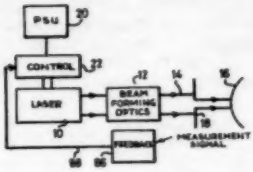
U.S. Cl. 364—413.01 **44 Claims**

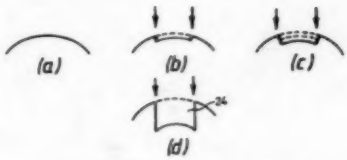
1. A laser system for eroding a surface, said laser system comprising:

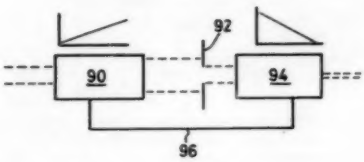
laser means for generating pulses of laser light along a beam path at an energy level, such that the pulses can be absorbed at a surface to induce photoablation;

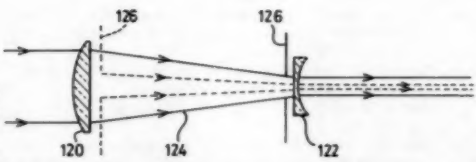
support means for aligning a surface relative to the laser means; and

beam dimension control means disposed along said laser beam path, including optical means for optically varying an area on the surface to which the pulses of laser energy









are delivered while maintaining a substantially constant energy per unit area during each pulse.

4,941,094

IMAGE RECONSTRUCTION DATA PROCESSING UNIT

Yusuke Satta, and Yasuro Takiura, both of Tokyo, Japan, assignors to Yokogawa Medical Systems, Ltd., Tokyo, Japan

PCT No. PCT/JP88/00169, § 371 Date Oct. 12, 1988, § 102(e) Date Oct. 12, 1988, PCT Pub. No. WO88/06321, PCT Pub. Date Aug. 25, 1988

PCT Filed Feb. 19, 1988, Ser. No. 274,997

Claims priority, application Japan, Feb. 19, 1987, 62-36600; Feb. 27, 1987, 62-44327

Int. Cl.[5] G06F *15/40*

U.S. Cl. 364—413.21 **4 Claims**

1. An image reconstruction data processing unit comprising

a plurality of fast processing units for providing respective sets of projection data or different views;

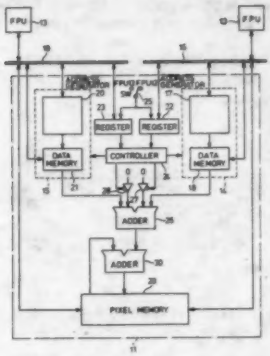
a plurality of parts corresponding to said plurality of last processing units back projection execution for extracting from said sets of projection data a desired set of projection data and for generating a first output projection data on a common pixel of interest relative to the extracted desired set of projection data;

a first adder for obtaining a total sum of signals related to said first output projection data and signals related to said sets of projection data, and for generating a second output signal indicative of said total sum;

a pixel memory having addresses corresponding to pixels of a reconstruction image; and

a second adder for adding data read out from an address in

said pixel memory corresponding to said common pixel of interest to said second output signal so that image reconstruction is performed by parallel operation of said plurality of fast processing units.

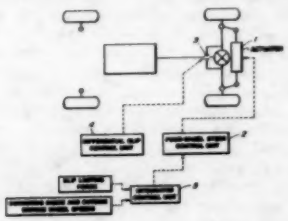


4,941,095

INTEGRATED FOUR-WHEEL STEER AND DIFFERENTIAL SLIP CONTROL SYSTEM

Takashi Imaseki, and Yuji Kobari, both of Zushi, Japan, assignors to Nissan Motor Co., Ltd., Yokohama, Japan

Filed Sep. 21, 1988, Ser. No. 247,464
Claims priority, application Japan, Sep. 29, 1987, 62-245684
Int. Cl.[5] B62D 6/02
U.S. Cl. 364—424.05 **9 Claims**



1. A method of controlling a four-wheel steer and a differential slip for a wheeled vehicle, the vehicle having a set of steerable rear driving wheels, a differential interposed between the rear wheels, clutch means for supplying a slip limiting force to the differential to limit a differential action thereof and actuator means for actuating the rear wheels, the method comprising:

detecting a vehicle cornering condition and determining a slip limiting force based on a detected vehicle cornering condition;

judging whether the slip limiting force is equal to or larger than a predetermined value during cornering of the vehicle;

obtaining a cornering outside driving wheel speed and a cornering inside driving wheel speed based on the detected vehicle cornering condition;

judging whether the cornering outside driving wheel speed is faster than the cornering inside driving wheel speed; and

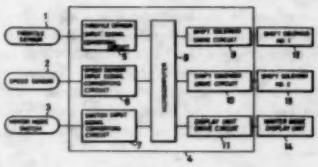
correctively steering the rear driving wheels in the direction opposite to that of the front wheels when the slip limiting force is equal to or larger than the predetermined value and the cornering outside driving wheel speed is faster than the cornering inside driving wheel speed.

4,941,096

ELECTRONICALLY CONTROLLED AUTOMATIC TRANSMISSION

Yasunobu Ito, and Kenji Suzuki, both of Anjo, Japan, assignors to Aisin-Warner Kabushiki Kaisha, Anjo, Japan

Filed Dec. 9, 1987, Ser. No. 130,776
Claims priority, application Japan, Dec. 10, 1986, 61-294415
Int. Cl.[5] B60K 41/18; G05D 17/02
U.S. Cl. 364—424.1 **4 Claims**



3. An electrically controlled automatic transmission for an automotive vehicle having shift solenoids for controlling gear selection of said transmission, comprising:

an electronic control unit for driving said shift solenoids in an ordinary shifting mode by responding to signals from a throttle opening sensor and vehicle velocity sensor including engaging a low gear for initial movement of said vehicle;

switch means for manually engaging one of said ordinary shifting mode and a high gear start-up;

said electronic control unit having decision means for determining whether an instant state of vehicle velocity is within an acceptable region for said low gear, when said high gear start-up has been engaged;

high gear start-up output means driving said solenoids to engage a higher gear than said low gear for initial movement of said vehicle, when said high gear start-up has been engaged and said instant state of vehicle velocity is within said acceptable region for said low gear; and

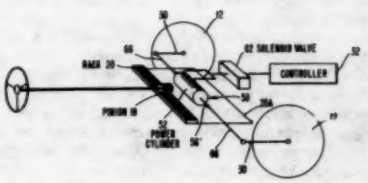
high gear start-up dismissal means for switching from said high gear start-up to said ordinary shifting mode, when said high gear start-up has been engaged and said instant state of vehicle velocity is outside of said acceptable region for said low gear.

4,941,097

STEERING CONTROL METHODS AND APPARATUS

Dean C. Karnopp, and Yoshiyuki Yasui, both of Davis, Calif., assignors to Aisin Seiki Kabushiki Kaisha, Kariya, Japan

Filed Sep. 13, 1988, Ser. No. 243,822
Int. Cl.[5] B62D 5/22
U.S. Cl. 364—424.05 **10 Claims**



1. Apparatus for maintaining steering stability of a moving vehicle comprising:

steerable wheels and steering arm means connected to said steerable wheels, and

steering means for steering said steerable wheels, including a movable rack, a main steering mechanism, including a

steering wheel and pinion, connected to said movable rack for moving said movable rack,

motor means operably interconnecting said movable rack and said steering arm means for transmitting steering forces from said main steering mechanism to said steerable wheels, said motor means comprising relatively movable first and second parts, said first part connected to said movable rack and said second part connected to said steering arm means,

measuring means for measuring an actual yaw rate of said vehicle, and

control means for determining a desired yaw rate for said vehicle, and for generating an output signal in response to a comparison of said desired and actual yaw rates,

said control means being operably connected to said motor means whereby said motor means is actuated in response to said output signal to steer said steerable wheels independently of movement of said movable rack.

4,941,098

SPEED CONTROL UNIT FOR AN AUTOMOBILE

Takeshi Yasukawa, and Masayoshi Onishi, both of Himeji, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

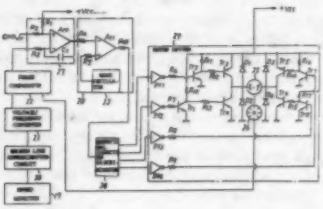
PCT No. PCT/JP87/00597, § 371 Date Jun. 2, 1988, § 102(e) Date Jun. 2, 1988, PCT Pub. No. WO88/01240, PCT Pub. Date Feb. 25, 1988

PCT Filed Aug. 10, 1987, Ser. No. 184,556

Claims priority, application Japan, Aug. 19, 1986, 61-194265; Aug. 19, 1986, 61-194266

Int. Cl.[5] B60K *31/04*

U.S. Cl. 364—426.04 **2 Claims**



1. A speed control unit for an automobile in which a throttle valve is operated by an electric actuator driven by a motor, and a driving speed of said automobile is adjusted by controlling a throttle opening, said control unit comprising:

a broken line approximation circuit to which a speed signal proportional to a speed of the automobile is inputted to obtain an analog output signal corresponding to a specified gain characteristic of the driving speed of the automobile with respect to a throttle valve opening speed of said throttle valve;

a voltage/frequency converter which obtains a reference pulse signal corresponding to said analog output signal of the broken line approximation circuit;

an encoder for outputting a motor speed pulse signal;

a phase comparator which compares said motor speed pulse signal of said motor with said reference pulse signal, and generates an output pulse having a pulse width proportional to a phase difference therebetween;

integration means for obtaining an integration value of the output pulse; and

drive control means which carries out pulse width modulation of said integration value of the output pulse of said phase comparator by a triangular wave or a sawtooth wave, and controls said motor in such a manner that the throttle valve opening speed is variably controlled corresponding to the driving speed of the automobile.

4,941,099

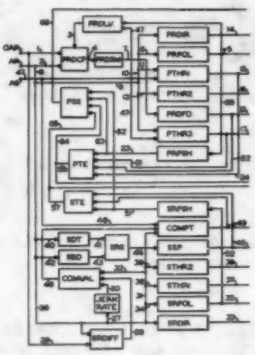
ELECTRONIC ADHESION ADAPTIVE WHEEL SLIDE PROTECTION ARRANGEMENT FUNCTION

James A. Wood, Spartanburg, and Richard J. Mazur, Greer, both of S.C., assignors to American Standard Inc., Spartanburg, S.C.

Filed May 16, 1988, Ser. No. 194,249

Int. Cl.[5] B60T *8/72, 8/80, 8/86*

U.S. Cl. 364—426.02 **36 Claims**



1. An electronic slip control system for a multiple-truck railway vehicle comprising, a standard slip control logic means responsive to axle speed and rate signals to produce a multi-bit binary number word, a primary slip control word formation means for converting the multi-bit binary number word to a hexidecimal number word which is conveyed to a primary slip control table means, said primary slip control table means conveys the hexidecimal number word to a table output selection means, a synchronous slip control logic means responsive to the axle speed and rate signals to produce a multi-bit binary word, a synchronous slip control word formation means for converting the multi-bit binary number word to a hexidecimal number word which is conveyed to a synchronous slip control table means, said synchronous slip control table means conveys the hexidecimal number word to said table output selection means which is connected to intermediate circuit means, and said intermediate circuit means causes an appropriate control signal to be conveyed to a brake valve for preventing wheel slip.

4,941,100

AUTOMATIC EDGER SAW

Arthur M. G. McFarlane, 1873 Redman Rd., Hamlin, N.Y. 14464, and Stuart R. McFarlane, 1 Craig Hill Dr., Brockport, N.Y. 14420

Filed Nov. 30, 1988, Ser. No. 278,279

Int. Cl.[5] G06F *15/46*; B27B *7/02*

U.S. Cl. 364—474.09 **26 Claims**

1. A controller for a head rig edger for edging a board as it is cut from a log characterized by an irregular surface contour by a head saw comprising:

inspection means for determining the surface contour of the log to be sawed in the plane of the headsaw;

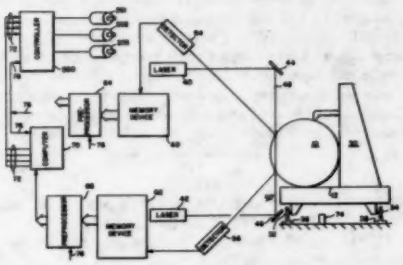
calculating means responsive to said inspection means for selecting an edger line through said log to produce a board satisfying predetermined criteria; and

control means connected to said calculating means for providing control signals to said edger for causing said edger to cut said board along said line.

14. A controller for a head rig edger for edging boards as they are cut from a log having an irregular surface by a head saw in a plurality of passes comprising:

inspection means for determining during a pass of the log ever the head saw, the surface contour of a board to be sawed from the log during a subsequent pass of the log past the headsaw;

calculating means responsive to said inspection means for



selecting an edger line through said log to produce a board satisfying predetermined criteria; and

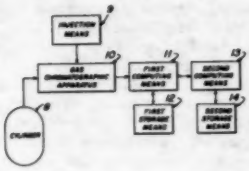
control means connected to said calculating means for providing control signals to said edger for causing said edger to cut said board along said line during said subsequent pass of said log past the headsaw.

4,941,101

METHOD FOR ANALYZING CHROMATOGRAMS

Paul B. Crilly, Coatesville, Pa., assignor to Hewlett-Packard Company, Palo Alto, Calif.

Filed Sep. 1, 1987, Ser. No. 91,637
Int. Cl.[5] G01N *31/08*
U.S. Cl. 364—497 **21 Claims**



1. Method of resolving fused peaks present in a chromatogram provided by a chromatographic apparatus, wherein the fused peaks are representative of at least two components of a sample that has been injected into the chromatographic apparatus, comprising the steps of:

(a) providing a first data set indicative of the chromatogram to the processing means;

(b) applying, via the processing means, a selected number of iterations of a peak resolution function of the type employing Jansson's iterative deconvolution method to at least a selected portion of the first data set for resolving the fused peaks; and

wherein the peak resolution function is applied to the first data set according to:

$$x^{(k+1)}(t)=x^{(k)}(t)+r\,[x^{(k)}(t)](g(t)-h(t)*x^{(k)}(t))$$

where:

$x^{(k)}(t)$ is the k'th estimate of x(t);

$r[x^{(k)}(t)]$ is the relaxation function;

g(t) is the first data set;

h(t) is an impulse response function of the chromatographic apparatus; and,

(c) providing a second data set representative of the result of the iterations of the peak resolution function; and,

(d) determining an appropriate retention time for the sample;

(e) selecting a pure compound having a retention time approximating the retention time of the sample;

(f) injecting the pure compound into the chromatographic apparatus;

(g) producing a chromatogram indicative of the impulse response function for the chromatographic apparatus; and

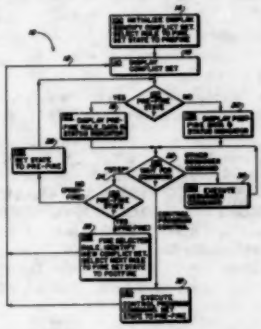
(h) providing an impulse response function data set indicative of the impulse response function chromatogram to the processing means.

4,941,102

TWO-STEP DEBUGGER FOR EXPERT SYSTEMS

Michael J. Darnell, Aptos; Joseph M. Hary, Los Gatos, and Robert J. Quinn, Fremont, all of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 16, 1988, Ser. No. 245,675
Int. Cl.[5] G06F *15/24*
U.S. Cl. 364—513 **26 Claims**



1. In an expert system including storage means for storing data and rules, and execution means for identifying one or more eligible rules (instantiations) based on the data, selecting one of those rules and firing rule to modify the data, the improvement characterized by a debugger comprising:

(a) means for displaying at least one of the eligible rules;

(b) means for displaying at least part of the data; and

(c) means responsive to the user for alternating between at least

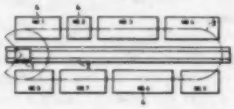
(i) a prefire state before firing of the selected rule, in which at least one of the eligible rules and at least part of the data are automatically displayed, and

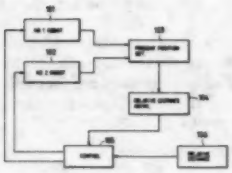
(ii) a postfire state after firing of the selected rule, in which at least one of the newly-identified eligible rules and at least part of the modified data are automatically displayed.

4,941,103
RUNNING TYPE ROBOT CONTROL SYSTEM

Hisao Kato, Aichi, Japan, assignor to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Sep. 12, 1988, Ser. No. 242,577
Claims priority, application Japan, Sep. 11, 1987, 62-226571; Sep. 30, 1987, 62-247214
Int. Cl.[5] B62D 1/24
U.S. Cl. 364—513 8 Claims





1. A running type robot control system, comprising:

at least two running type robots running along a common running path, running ranges of said robots overlapping with each other;

present position detecting means for detecting respective present positions of said robots;

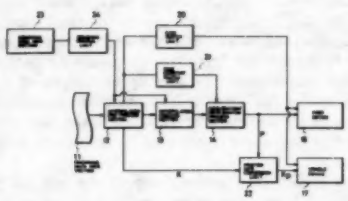
arithmetic calculating means for arithmetically calculating a relative distance between adjacent ones of said robots, based on outputs from said detecting means, the outputs representing the respective present positions of said robots; and

controlling means, coupled to said arithmetic calculating means, for controlling at least one of said robots which is adjacent to another of said robots so that the relative distance therebetween is maintained not smaller than a minimum predetermined standard distance.

4,941,104
NUMERICAL CONTROL APPARATUS FOR CONTROLLING A THREADING OPERATION

Takeo Teshima, and Makoto Konno, both of Aichi, Japan, assignors to Mitsubishi Denki Kabushiki Kaisha, Tokyo, Japan

Filed Apr. 27, 1988, Ser. No. 186,858
Claims priority, application Japan, Apr. 27, 1987, 62-101748; Feb. 15, 1988, 63-30980
Int. Cl.[5] G05B 19/24; B23G 1/04
U.S. Cl. 364—474.3 3 Claims



1. A numerical control apparatus for controlling a control shaft and a spindle of a machine device according to machining data comprising:

time constant switching means for switching an acceleration or deceleration time constant of said control shaft in response to an instruction;

gain switching means for switching a position loop gain of said control shaft according to an instruction;

position data conversion means for multiplying position data by a predetermined coefficient, said position data being subjected to arithmetic operation with a time constant selected by said time constant switching means; and

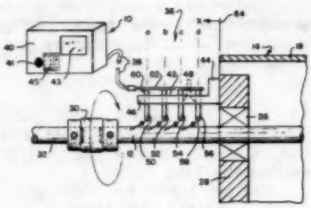
a spindle device having a position loop control function,

the position of said control shaft being controlled with the time constant selected by said time constant switching means and at the same time an output of said position data conversion means being applied to said spindle device to control said device.

4,941,105
METHOD AND APPARATUS FOR MEASURING DYNAMIC BEARING FORCE

Roy D. Marangoni, Pittsburgh, Pa., assignor to University of Pittsburgh, Pittsburgh, Pa.

Filed Sep. 29, 1988, Ser. No. 251,690
Int. Cl.[5] G06F 15/20
U.S. Cl. 364—506 10 Claims



1. Apparatus for measuring at least one of the dynamic force and dynamic moment exerted by a rotated shaft on a bearing comprising,

a support member adapted to extend outwardly from the bearing in overlying relation with the shaft,

a plurality of sensors for detecting displacement of the shaft relative to the sensor and generating a electrical signal proportional to the displacement

said sensors located adjacent one another on said support member, each sensor positioned a preselected distance from the bearing and spaced from the shaft

control means electrically connected to each of said sensors for receiving from each sensor an electric signal proportional to the shaft dynamic displacement at the location of each sensor from the bearing, and

said control means upon actuation operable to receive a displacement signal from each sensor and combine the displacement signals to generate a readout of at least one of the dynamic force and the dynamic moment applied by the shaft to the bearing.

4,941,106
APPARATUS FOR RECOGNIZING AND APPROACHING A THREE-DIMENSIONAL TARGET

Friedrich Krieger, Würzburg, Fed. Rep. of Germany, assignor to Noell GmbH, Würzburg, Fed. Rep. of Germany

Filed Dec. 5, 1988, Ser. No. 280,398
Claims priority, application Fed. Rep. of Germany, Dec. 5, 1987, 3741632
Int. Cl.[5] B25J 9/00
U.S. Cl. 364—513 11 Claims

1. An apparatus for recognizing and approaching a target in a space with an industrial robot of a type which has a camera on an end of a boom of said industrial robot, said camera being used to observe an environment of said space including said

target and to send images thereof to a monitor at a remote control station, said apparatus comprising:

said industrial robot having a plurality of axes having degrees of freedom;

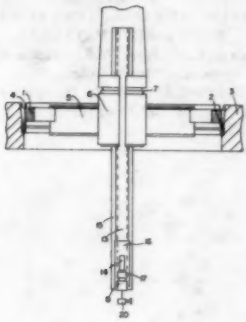
said camera having a lens with an optical axis;

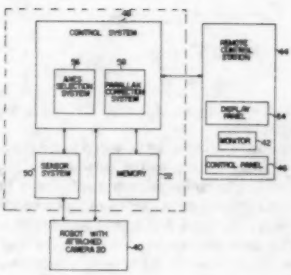
means for selectively rotating said camera and said optical axis thereof by 360 degrees around a first axis of said plurality of axes;

means for selectively pivoting said camera and said optical axis thereof by 180 degrees around a second axis of said plurality of axes which is perpendicular to said first axis;

said means for selectively rotating and said means for selectively pivoting being used to move said camera and said optical axis thereof until said target can be seen in said monitor and located at a target position therein;

said camera having a camera position relative to said optical axis thereof and said optical axis having a target direction when said target is at said target position in said monitor;





means for moving said industrial robot through said degrees of freedom for each of said axes of said plurality of axes:

said means for moving said industrial robot including said means for selectively rotating and said means for selectively pivoting:

control means for controlling said means of moving;

said control means including means for sensing said camera position and said target direction of said optical axis;

said control means maintaining said camera position and said target direction during controlled movement of said end of said boom along said target direction to said target: and

said controlled movement by said control means being produced by said means for moving of a first group of said axes of said plurality of axes while said axes of a second group of said plurality of axes are limited to synchronous movement in direct response to said controlled movement of said axes of said first group.

4,941,107

IMAGE DATA PROCESSING APPARATUS

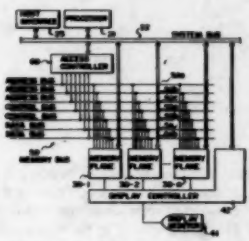
Kouki Hasebe, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Nov. 17, 1987, Ser. No. 121,884

Claims priority, application Japan, Nov. 17, 1986, 61-273655; Nov. 17, 1986, 61-273656

Int. Cl.[5] G06F 3/153, 9/00

U.S. Cl. 364—518 20 Claims



1. An image data processing apparatus for processing image data in a pipe line fashion, comprising:

first and second address buses;

a control bus;

a first data bus;

means for providing an input processing command;

main control means for generating an access control instruction and a memory plane control instruction in response to said input processing command;

access control means connected to said first and second address buses, said control bus, and said first data bus and operating in synchronism with machine cycles and in response to said access control instruction from said main control means, for selectively generating and respectively outputting onto said first and second address buses first and second addresses, and for generating and outputting onto said control bus read-modified-write control data;

a first memory plane connected to said first address bus, said control bus, and said first data bus, and operating in synchronism with said machine cycles and in response to said memory plane control instruction from said main control means and said read-modified-write control data from said access control means, comprising:

first memory plane memory means for outputting first image data stored at said first address over said first address bus at a first half of each machine cycle, and

first memory plane data output means for outputting said first image data as first transfer data onto said first data bus at said first half of cycle, and

a second memory plane connected to said second address bus, said control bus, and said first data bus, and operating in synchronism with said machine cycles and in response to said memory plane control instruction from said main control means and said read-modified-write control data from said access control means, comprising:

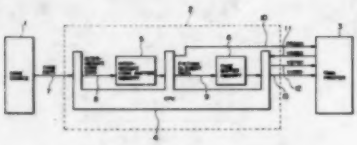
second memory plane processing means for receiving said first transfer data from said first data bus as first operation data at a second half of each machine cycle and performing a first operation designated by said memory plane control instruction, on said first operation data to obtain second image data, and

second memory plane memory means for storing said second image data at said second address at said second half of each machine cycle.

4,941,108
INTERFACE FOR SENDING PRINTER REQUEST SIGNALS TO A PRINTER

Yuuji Aoyagi, Hitachi, and Seiji Kageyama, Fuchu, both of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 22, 1988, Ser. No. 184,789
Claims priority, application Japan, May 2, 1987, 62-109447
Int. Cl.[5] G06F *3/12*; G06K *15/00*
U.S. Cl. 364—519 6 Claims



1. In a printer interface system or sending a printer request signal to printer means wherein code data transmitted from a data source is converted to intermediate code data, said intermediate code data being stored in an intermediate code buffer memory member, and said intermediate code data being converted to picture element data, said picture element data being stored in a page buffer memory member, and said picture element data being transmitted from said page buffer memory member to an printer means in company with a printing process preparation signal, an improvement comprising:

wherein after said code data transmitted from said data source is converted to said intermediate code data and stored in said intermediate code buffer memory member,

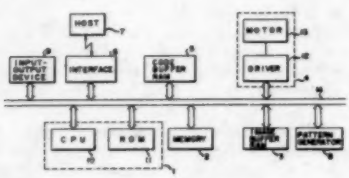
wherein a format of said code data is judged to determine whether a conversion processing of said corresponding intermediate code data to said picture element data requires a processing time which extends beyond a predetermined time limit,

wherein a control code data, supplied by said data source and indicating one page part finishing is converted to intermediate code data and stored in said intermediate code buffer memory member, and said printing process preparation signal is outputted to said printer means in company with a processing in which said intermediate code data is converted to said picture element data.

4,941,109
METHOD OF EFFECTIVELY PERFORMING A FEED OPERATION AND PRINTING APPARATUS FOR REALIZING THE METHOD

Shingo Kikukawa, Oome, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Apr. 23, 1986, Ser. No. 855,102
Claims priority, application Japan, Apr. 24, 1985, 60-86469
Int. Cl.[5] G06F *3/12*
U.S. Cl. 364—519 19 Claims



1. A printing apparatus which performs a feed operation for a continuous paper, comprising:

memory means for storing total feed data indicating a total number of lines to be totally fed from a current printing line and a direction to be fed;

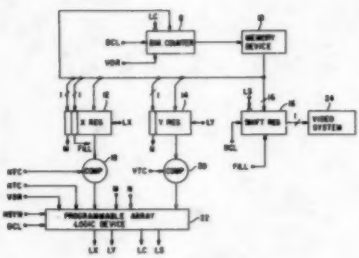
feed means responsive to a feed execution instruction for feeding the continuous paper from said current printing line to a line expected in accordance with the total feed data received by said feed means, said line expected being a line number indicating the number of lines from the first line of the continuous paper to the line number after feeding in accordance with said total feed data; and

feed control means coupled to said memory means and said feed means, for updating said total feed data by feed data in accordance with a feed instruction received by said feed control means, said feed data being designated by said feed instruction and indicating the number of lines to be fed and a direction to be fed, for reading out the total feed data from said memory means, for supplying said feed execution instruction together with the total feed data to said feed means in response to a printing instruction input to said feed control means and for resetting the total feed data in the memory means after said feed execution instruction is supplied to said feed means.

4,941,110
MEMORY SAVING ARRANGEMENT FOR DISPLAYING RASTER TEST PATTERNS

Robert G. Bassman, Little Ferry, N.J., assignor to Allied-Signal, Inc., Morris Township, Morris County, N.J.

Filed Nov. 2, 1988, Ser. No. 266,042
Int. Cl.[5] G06F *15/62*
U.S. Cl. 364—521 6 Claims



1. A memory saving arrangement for displaying raster test patterns, comprising:

memory means storing a list of video words to be displayed, in order from the top to the bottom of a display screen, and from left to right on each display scan line;

means for addressing the memory means whereby said memory means provides a first digital word representing the Y value, i.e. scan line numbers on which the first video word appears on the top of the screen, a second digital word representing the X value on that scan line, and then provides pixel data;

the X value digital word having a bit which signifies whether there is more data following for the same scan line and whether the X value is the last data for that scan line, and the Y value digital word having a bit which signifies whether the pixel data is displayed on a single scan line and whether said data is to be repeated on a plurality of scan lines;

first counter means for generating a horizontal timing count signal;

second counter means for generating a vertical timing count signal;

means for comparing the X value word to the horizontal timing count signal and generating a first comparison signal;

means for comparing the Y value word to the vertical timing count signal and generating a second comparison signal;

means responsive to the first and second comparison signals for rendering the arrangement in a "wait" mode when a

correct scan line is reached and for maintaining the arrangement in the "wait" mode until the correct X value on that scan line is reached;

means for receiving the pixel data at the end of the "wait" mode and for generating corresponding output; and

means connected to the receiving means and responsive to the output therefrom for displaying an analog composite video signal.

4,941,111

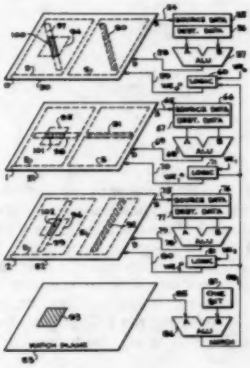
VIDEO PICKING AND CLIPPING METHOD AND APPARATUS

Adrian Sfarti, Sunnyvale, Calif., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Apr. 18, 1986, Ser. No. 853,492

Int. Cl.[5] G06F *15/72*

U.S. Cl. 364—521 **20 Claims**



15. An apparatus for clipping a data object appearing on a video display in a video system when said data object is moved from a source area S on said display to a destination area D on said display, comprising:

a bit map comprising a data plane for storing a data object and a match plane for storing a clipping object, said data plane and said match plane comprising spatially corresponding pixels and said clipping object comprising pixels having a predetermined logical binary value;

a one-bit register for storing a bit having a predetermined logical binary value;

means for moving said data object in said data plane from an area corresponding to said source area S on said display to an area corresponding to said destination area D on said display;

means for scanning the pixels in said data plane as said data object is being moved;

means for scanning the pixels in said match plane as said data object is being moved;

means for comparing said pixels in said match plane and the contents of said one-bit register as said pixels in said match plane are being scanned; and

means for enabling said data plane to store in said data plane in said area corresponding to said destination area D on said display each pixel scanned in said data plane which corresponds spatially with a pixel in said match plane when said pixel in said match plane has a predetermined correspondence with the contents of said one-bit register.

4,941,112

METHOD AND DEVICE TO MEASURE THE LITHIUM CONCENTRATION IN THE PRIMARY COOLING CIRCUIT OF A NUCLEAR REACTOR

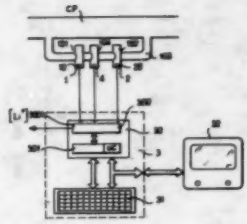
Christian Nepveu de Villemarceau, Dammarie Les Lys; Jean-Luc Pereira, Chauny; Jean-Pierre Blin, Dammarie Les Lys; Anne-Marie Arzel, Le Mee Sur Seine, and Didier Livigni, Chatillon sur Loire, all of France, assignors to Electricite de France (National Service), Paris, France

Filed May 31, 1988, Ser. No. 201,045

Claims priority, application France, Jun. 2, 1987, 87 07690

Int. Cl.[5] G06F *15/20*; G05D *21/02*

U.S. Cl. 364—527 **14 Claims**



1. A method for measuring and controlling the lithium concentration in the primary cooling circuit of the pressurized-water reactor of a nuclear power station, wherein said method comprises:

measuring the electrical conductivity λ of the cooling water, or a sample thereof, of said primary circuit,

measuring the temperature of the cooling water to define a given temperature (t);

converting said measured values obtained for said electrical conductivity λ and said given temperature (t) into signals and inputting the signals into a computer;

utilizing said computer to determine from the conductivity and temperature signals a value $[Li^+]$ for the lithium concentration by linear correlation between said electrical conductivity λ of the cooling water and this concentration;

said lithium concentration being determined from a linear combination of the electrical conductivity having the form:

$$[Li^+]=\alpha\cdot\lambda+\beta$$

a relationship wherein:

$[Li^+]$: represents the concentration in lithium ions, expressed in parts per million,

α: represents a ratio coefficient;

β: represents a corrective term for the presence of impurities, if any, in the primary circuit cooling water, the term β being determined by the periodic ancillary measurement of the lithium concentration by atomic absorption spectrometry;

said electrical conductivity λ of the cooling water being a linear function of the temperature;

the electrical conductivity $\lambda(t)$ measured at a given temperature t, having the relationship:

$$\lambda(25)=\lambda(t)+a\cdot[25-t]$$

a relationship in which,

$\lambda(25)$: represents the conductivity of the cooling water at 25° C.,

a: represents a coefficient that varies as a function of the lithium concentration; and

utilizing the computed lithium concentration $[Li^+]$ value to

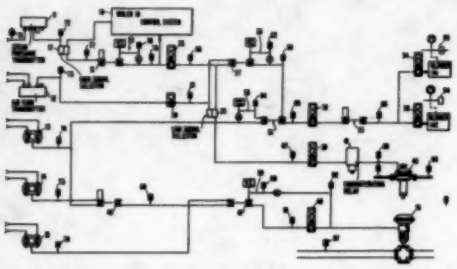
regulate the lithium concentration and pH value of the cooling water of the primary circuit of a nuclear power station reactor.

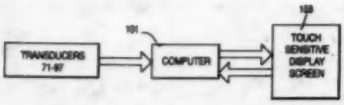
4,941,113

COMPUTER MONITORING AND TESTING OF AUTOMATIC CONTROL SYSTEM

Marton J. Dundics, 2448 Holly Ave., Suite 200, Annapolis, Md. 21401, and Robert S. Bradlee, 2551 Eltham Ave., Suite L, Norfolk, Va. 23513

Filed Jun. 15, 1988, Ser. No. 206,495
Int. Cl.[5] G06F *15/46, 9/00*
U.S. Cl. 364—551.01 **7 Claims**





1. A system for monitoring an analog automatic control system, wherein said analog automatic control system controls a controlled system and includes means responsive to a plurality of parameters of said controlled system to control a plurality of devices in said controlled system, which devices affect the values of said parameters, said system for monitoring comprising:

a multiplicity of transducers sensing different analog signal values in said analog control system and to convert said analog signal values to digital signal values, a computer connected to receive said digital signal values, a display connected to said computer, said computer comprising means selectively operable to display different sequences of instructions to an operator, each sequence directing the operator to perform a series of manual steps to vary the operation of said automatic control system, said computer further comprising means to receive digital signals from said transducers in response to the operator performing any one of the series of manual steps, to compare the digital signals with standard values, and to indicate the results of such comparison to the operator.

4,941,114

TRIANGULAR MESH GENERATION METHOD

Naoyuki Shigyo, and Koichi Sato, both of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

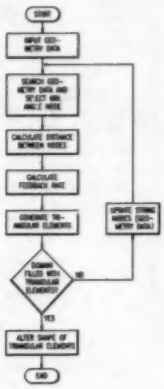
Filed Mar. 17, 1988, Ser. No. 169,480
Claims priority, application Japan, Mar. 26, 1987, 62-72120
Int. Cl.[5] G06F *15/60, 15/328, 7/64*
U.S. Cl. 364—578 **13 Claims**

1. A method for generating a triangular mesh formed of triangular elements within a domain of interest to be analyzed, the domain being surrounded by topography string nodes with the triangular mesh discretizing an equation defined in the domain, comprising:

a first step of inputting geometry data denoting coordinates of said topography string nodes;

a second step of selecting a node having a minimum internal boundary angle among the topography string nodes by searching said geometry data;

a third step of calculating the distances between the selected node and two nodes adjacent to the selected node and the distance between pairs of adjacent nodes for all of said topographic nodes;



a fourth step of calculating a feedback rate which is defined by a ratio of a mean value of the distances between the selected node and two nodes adjacent to the selected node to a mean value of the distance between pairs of adjacent nodes for all said topography nodes;

a fifth step of generating by way of a computer a triangular element in accordance with the minimum internal boundary angle by using the feedback rate; and

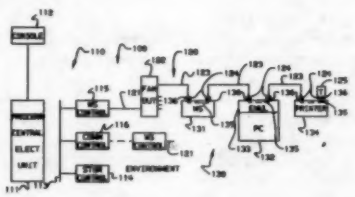
a sixth step of updating the topography string nodes by a computer, by eliminating the generated triangular elements.

4,941,115

HAND-HELD TESTER FOR COMMUNICATIONS PORTS OF A DATA PROCESSOR

James D. Nihart, and Samuel M. Prabhakar, both of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Jun. 20, 1988, Ser. No. 209,232
Int. Cl.[5] H04M *1/56*; H04B *3/50*
U.S. Cl. 364—580 **12 Claims**

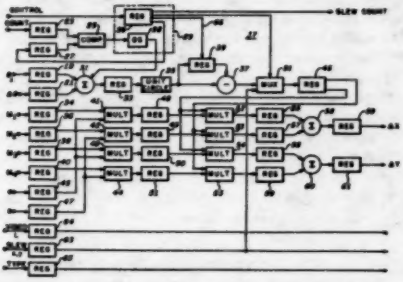


1. A hand-held port tester for testing input/output ports of a data-processing system, said ports having cables for attaching said system to input/output devices, said cables carrying a first signal being propagated at a first rate for communicating with said devices, wherein said first signal comprises at least one multi-bit code, said port tester comprising:

(a) housing means having a size and shape adapted to be carried in one hand;

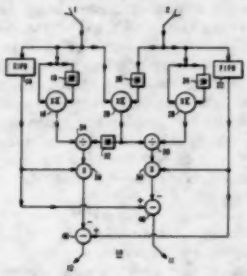
(b) connector means, including cable coupling means, attached to said housing means;
(c) receiver means, coupled to said connector means, for converting said first signal to a second signal;
(d) clock means for producing a clock signal that is synchronized with the rate of said first signal;
(e) decoder means, located within said housing and outside the system under test, coupled to said clock means and to said receiver means, for utilizing said second signal to detect the presence and integrity of said at least one multi-bit code;
(f) indicator means, mounted on said housing and responsive to said decoder means, for signalling a fault unless both the presence and integrity of said at least one multi-bit code is detected by said decoder means, and for otherwise signalling a successful test; and
(g) power means mounted in said housing for providing power to all the above means.

4,941,116
ELLIPTICAL ARC GENERATOR FOR DISPLAY SYSTEMS
William R. Hancock, Cedar Crest; Paul J. Short, and Thomas A. Weingartner, both of Albuquerque, all of N. Mex., assignors to Honeywell Inc., Minneapolis, Minn.
Filed Jul. 15, 1988, Ser. No. 220,052
Int. Cl.[5] G06F 1/02
U.S. Cl. 364—718 **23 Claims**



1. An elliptical arc segment generator for display system comprising:
means coupled to receive initial angle values and incremental angle values for incrementing said initial angle value by said incremental angle value to obtain cumulative angles and for providing cosine and sine differences for first and second cumulative angles to obtain sine and cosine difference values;
coordinate value means coupled to receive said cosine and sine difference values, major and minor axis scale factor values representative of major and minor axes of a preselected ellipse, and axis rotation values representative of axis rotations from respective reference axes for providing rotated incremental coordinate values;
means coupled to said product means for accumulating said rotated incremented coordinate values to establish a point on a display format; and
means for providing luminance levels for display at said point.

4,941,117
MULTIPLE CHANNEL ADAPTIVE CORRELATION/DECORRELATION PROCESSOR
Stanley M. Yuen, Marlton, N.J., assignor to General Electric Company, Moorestown, N.J.
Filed Sep. 7, 1988, Ser. No. 240,873
Int. Cl.[5] G06F 15/31
U.S. Cl. 364—724.07 **2 Claims**



1. A decorrelation processor for processing blocks of concurrent signals in first and second channels, said processor comprising:
first and second processor input ports coupled to said first and second channels, respectively, for receiving said blocks of signals from said first and second channels, respectively;
first subtracting means including an output port coupled to said first processor output port, and also including first and second input ports, for subtracting words applied to said first input port from words applied to said second input port;
second subtracting means including an output port coupled to said second processor output port, and also including first and second input ports, for subtracting words applied to said first input port from words applied to said second input port;
first multiplying means including first and second input ports, and also including an output port coupled to said first input port of said first subtracting means for multiplying together words applied to said first and second input ports of said first multiplying means to produce a first product, and for applying said first product to said first input port of said first subtracting means;
first FIFO delay means coupled to said second processor input port, to said first input port of said first multiplying means, and to said second input port of said second subtracting means, for delaying said signals applied to said second processor input port until an entire one of said blocks of signals has been received at said second processor input port, and for thereafter coupling said signals on a first in, first out basis to said first input port of said first multiplying means and to said second input port of said second subtracting means;
second multiplying means including first and second input ports, and also including an output port coupled to said first input port of said second subtracting means, for multiplying words applied to said first and second input ports of said second multiplying means to produce a second product, and for applying said second product to said first input port of said second subtracting means;
second FIFO delay means coupled to said first processor input port, to said first input port of said second multiplying means, and to said second input port of said first subtracting means, for delaying said signals applied to said first processor input port until an entire one of said blocks of signals has been received at said first processor input

port, and for thereafter coupling said signals on a first in, first out basis to said first input port of said second multiplying means and to said second input port of said first subtracting means;

first complex conjugate processing means coupled to said second processor input port, for generating the complex conjugate of each of said signals of each of said block of signals received at said second processor input port;

first summing multiplier means including first and second input ports and an output port, said first input port of said first summing multiplier means being coupled to said second processor input port, and said second input port of said summing multiplier means being coupled to said first complex conjugate processing means, for sequentially receiving said signals of said blocks of signals applied to said second processor input port, for multiplying each of said signals by its complex conjugate to produce third products, which third products are summed over the entirety of each of said blocks of signal to produce first summed products at said output port of said first summing multiplier means;

second summing multiplier means including first and second input ports and an output port, said first input port of said second summing multiplier means being coupled to said first processor input port for sequentially receiving said signals of said blocks of signals applied to said first processor input port, for multiplying each of said signals by a signal applied to said second input port of said second summing multiplier means to produce fourth products, which fourth products are summed over the entirety of one of said blocks of signal to produce second summed product at said output port of said second summing multiplier means;

second complex conjugate means coupled to said second input port of said second summing multiplier means, for coupling to said second input port of said second summing multiplier means signals corresponding to said complex conjugate of each of said signals of each of said blocks of signals received at said second processor input port, whereby said second summing multiplier means sums the product of each of said signals applied to said first processor input port multiplier by the complex conjugate of the corresponding one of said signals applied to said second processor input port;

first dividing means including a first input port coupled to said output port of said first summing multiplier means, a second input port coupled to said output port of said second summing multiplier means, and an output port coupled to said second input port of said first multiplying means, for dividing said second summed product by said first summed product to produce a first quotient, and for applying said first quotient to said second input port of said first multiplying means;

third complex conjugate processing means coupled to said first processor input port, for generating the complex conjugate of each of said signals of each of said blocks of signals received at said first processor input port;

third summing multiplier means including a first input port coupled to said first processor input port and a second input port coupled to said third complex conjugate processing means, and also including an output port, for sequentially receiving said signals of said blocks of signals applied to said first processor input port and for multiplying each of said signals by its complex conjugate to produce fifth products, which fifth products are summed over the entirety of each of said blocks of signal to produce third summed products at said output port of said third summing multiplier means;

fourth complex conjugate processing means coupled to said output port of said second summing multiplier means for producing the complex conjugate of said second summed products; and

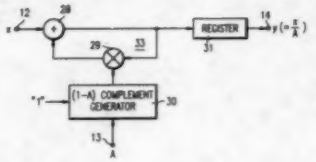
second dividing means including a first input port coupled to said output port of said third summing multiplier means, a second input port coupled to said fourth complex conjugate processing means, and an output port coupled to said second input port of said second multiplying means, for dividing said complex conjugate of said second summed products by said third summed products to produce a second quotient, and for applying said second quotient to said second input port of said second multiplying means.

4,941,118

DIVISION CIRCUIT HAVING AN OPERATION LOOP INCLUDING AN ADDER AND MULTIPLIER

Mitsu Yamazaki, and Kazuo Konisi, both of Kanagawa, Japan, assignors to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Sep. 26, 1988, Ser. No. 248,974
Claims priority, application Japan, Sep. 26, 1987, 62-241351
Int. Cl.[5] G06F 7/50
U.S. Cl. 364—761 **6 Claims**



1. A division circuit for calculating a division between a dividend and a divisor comprising:

a first input means for receiving the dividend;

a second input means for receiving the divisor;

an adder means connected at its first input terminal to a first input means for receiving the dividend and having a second input terminal;

a multiplier means connected at its first input terminal to the output terminal of the adder means and at its output terminal to the second input terminal of the adder means so that the adder means and the multiplier means constitute an operation loop, said multiplier means having a second input terminal;

a complement generator connected between said second input means and the second input of said multiplier means for generating a complement of the divisor equal to one minus the divisor; and

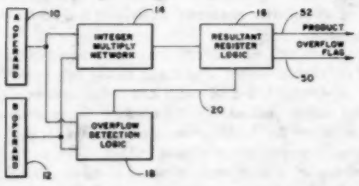
a registor means coupled to the output of said adder means for outputting a quotient obtained in the operation loop.

4,941,119

METHOD AND APPARATUS FOR PREDICTING AN OVERFLOW IN AN INTEGER MULTIPLY

Timothy W. Moline, Coon Rapids, Minn., assignor to Control Data Corporation, Minneapolis, Minn.

Filed Nov. 30, 1988, Ser. No. 278,294
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—745 **14 Claims**



1. Apparatus for predicting an overflow condition in a resultant register means for storing the resultant of an integer multiplication operation of first and second binary-coded integer

operands, said resultant register means having an established number of bit positions, said apparatus comprising:

first determining means for establishing a first number representative of the position in said first integer operand of the most significant bit having a predetermined value;

second determining means for establishing a second number representative of the position in said second integer operand of the most significant bit having said predetermined value;

adder means for summing said first and second numbers to determine a total number; and

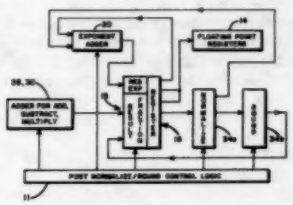
overflow indicator means for indicating an overflow condition whenever said total number exceeds the number of bit positions in said resultant register means.

4,941,120

FLOATING POINT NORMALIZATION AND ROUNDING PREDICTION CIRCUIT

Jeffrey D. Brown; Donald L. Freerksen; Scott A. Hilker, and Daniel L. Stasiak, all of Rochester, Minn., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Apr. 17, 1989, Ser. No. 339,347
Int. Cl.[5] G06F 7/38
U.S. Cl. 364—748 **4 Claims**



1. A circuit for normalizing floating point arithmetic results of certain predetermined types, and for predicting whether rounding is necessary by examination of predetermined bits in the arithmetic result, comprising

(a) means for detecting arithmetic operations of the multiply type, and addition of operands of same sign, and subtraction of operands of different signs, and activating a transfer sequence in response thereto;

(b) said transfer sequence including means for examining the two most significant bits of the result fraction and completing a transfer of the fraction and exponent result into a register according to the following procedure:

(i) if a multiply type and the two most significant fraction bits are of the form 1.X, transfer the results directly into said register, and increase the exponent by one;

(ii) if a multiply type and the two most significant fraction bits are of the form 0.1, transfer the fractional result into said register with a 1-bit left shift, and transfer the exponent directly, unchanged, into said register;

(iii) if an addition or subtraction type and the two most significant fraction bits are of the form 1.X, transfer the results directly into said register; and

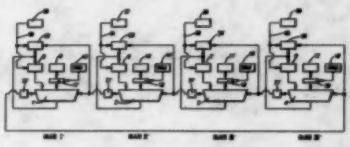
(iv) if an addition or subtraction type and the two most significant fraction bits are of the form 1X., transfer the fractional results directly into said register; with a 1-bit right shift, and transfer the exponent, increased by one, into said register.

4,941,121

APPARATUS FOR HIGH PERFORMANCE MULTIPLICATION

John H. Zurawski, Stow, Mass., assignor to Digital Equipment Corporation, Maynard, Mass.

Filed Apr. 1, 1988, Ser. No. 176,735
Int. Cl.[5] G06F 7/52
U.S. Cl. 364—757 **8 Claims**



1. A bit-sliced multiplier circuit, said multiplier circuit comprising a plurality of multiplier slices for independently performing multiplication of a multiplicand with a multiplier on an iterative basis, each of said multiplier slices comprising:

a. multiplier circuit means for forming the product of two numbers on an iterative basis, said multiplier circuit means including a means for changing a personality of a slice on an iterative basis;

b. accumulator circuit means, connected to said multiplier circuit means, for adding and storing the results from said multiplier circuit means on an iterative basis; and

c. carry-out register, connected to said accumulator circuit means, for storing carry-out data;

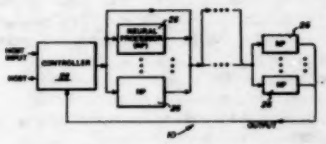
such that each slice of said bit-sliced multiplier circuit is connected to an adjacent slice only through interconnections of a non-critical nature.

4,941,122

NEURAL NETWORK IMAGE PROCESSING SYSTEM

William E. Weideman, Arlington, Tex., assignor to Recognition Equipment Incorp., Irving, Tex.

Filed Jan. 12, 1989, Ser. No. 296,520
Int. Cl.[5] G06F 15/18; G06K 9/62
U.S. Cl. 364—807 **6 Claims**



1. a neural-simulating system for processing an input stimulus, comprising:

a plurality of layers, each layer receiving layer input signals and generating layer output signals, said layer input signals including signals from the input stimulus and ones of said layer output signals from only previous layers within said plurality of layers;

each of said plurality of layers including a plurality of neurons operating in parallel on said layer input signals applied to said plurality of layers;

each of said neurons deriving neuron output signals from a continuously differentiable transfer function for each of said neurons based upon a combination of sets of weights associated within said neurons and said layer input signals;

said plurality of neurons with a layer being arranged in

groups of neurons operating in parallel on said layer input signals; and

weight constraining means associated with each of said group of neurons for causing each of said groups of neurons to extract a different feature from said layer input signals and for further causing each neuron with a group of neurons to operate on a different portion of said layer input signals.

4,941,123

DATA COMMUNICATIONS SYSTEM WITH AUTOMATIC COMMUNICATIONS MODE

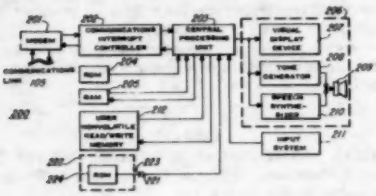
E. Earle Thompson, Dallas, Tex., assignor to Texas Instruments Incorporated, Dallas, Tex.

Division of Ser. No. 264,882, May 18, 1981, Pat. No. 4,519,029. This application Dec. 17, 1984, Ser. No. 682,502

The portion of the term of this patent subsequent to May 21, 2002, has been disclaimed.

Int. Cl.[5] G06F *3/00*

U.S. Cl. 364—200 12 Claims



1. A data communication system comprising:

a host data processing system for performing predetermined data processing functions and for generating output signals comprising the results of said predetermined data processing functions in response to receiving data processing request signals, said preformed data processing functions corresponding to said received data processing request signals;

data transmission means connected to said host data processing system for transmitting signals generated by said host data processing system and for transmitting signals to said host data processing system; and

a remote data processing system connected to said data transmission means having means for receiving output signals from said host data processing system transmitted by said data transmission means, memory means storing a plurality of sets of data processing request signals each in a predetermined order, operator selection means for generating an operator initiation signal to provide for operator selection of one of said sets of data processing request signals, memory access means operably coupled to said memory means and said operator selection means for recalling said selected set of data processing request signals from said memory means in said predetermined order in response to an operator initiation signal as generated by said operator selection means, and output means connected to said memory access means for applying said recalled data processing request signals to said data transmission means for transmission to said host data processing system.

4,941,124

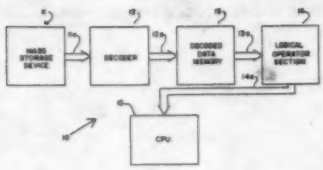
TEXT COMPARATOR WITH COUNTER SHIFT REGISTER

James T. Skinner, Jr., 780 Yale Rd., Boulder, Colo. 80303

Division of Ser. No. 456,989, Jan. 12, 1983, Pat. No. 4,625,295, which is a continuation-in-part of Ser. No. 342,620, Jan. 25, 1982, Pat. No. 4,531,201. This application Jun. 11, 1986, Ser. No. 851,643

Int. Cl.[5] G06F *15/40, 7/02*

U.S. Cl. 364—900 9 Claims



1. A textual comparison system for locating within textual material the occurrence of a first desired character string within a selected number of K (where K is a positive integer) words of a second desired character string comprising:

first means for locating within textual material the presence of said first desired character string, said first means for locating providing a first signal indicating whether said first desired character string has been located;

second means for locating within textual material the presence of said second desired character string, said second means for locating providing a second signal indicating whether said second desired character has been located;

a first shift register which receives as an input signal said second signal;

a second shift register which receives as an input signal said second signal;

means for clocking said first shift and second shift registers at the end of each work within said textual material;

a first logical gate having a plurality of K input leads connected to the K least significant output leads of said first shift register, and wherein said first logical gate provides a first output signal indicating whether said first desired character string is located within the previous K words;

a second logical gate having a plurality of K input leads connected to the K least significant output leads of said second. shift register, and wherein said second logical gate provides a second output signal indicating whether said second desired character string is located within the previous K words; and

a third logical gate receiving as input signals said first and said second output signals, thereby providing a third output signal indicating whether said first desired character string is located within K words of said second desired character string.

4,941,125

INFORMATION STORAGE AND RETRIEVAL SYSTEM

Walter J. Boyne, Alexandria, Va., assignor to Smithsonian Institution, Washington, D.C.

Filed Aug. 1, 1984, Ser. No. 636,758

Int. Cl.[5] G06F *3/00, 15/62*

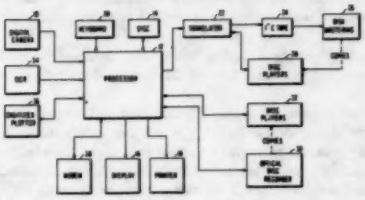
U.S. Cl. 364—900 9 Claims

1. An archival document image storage and retrieval system for storing image information representing the content of a plurality of archival documents, maintaining an index of descriptive terms and documents, and retrieving stored image information corresponding to a particular document in accor-

dance with said index upon identification of a corresponding descriptive term, said system comprising:

a camera for generating electronic digital output signal representing the image of a document;

data processing means for providing a processor output representing both said image and index information corresponding to said document, said data processing means including means for receiving and storing said digital output signals from said camera representing a plurality of



document images, means for retrieving said stored images from said means for storing after said digital signals representing said plurality of document images have been stored, means for recognizing the content of the images retrieved from said means for storing and producing recognition results, and means for generating said index information in accordance with said recognition results to thereby obtain said processor output; and

digital optical storage means for optically recording said processor output.

4,941,126

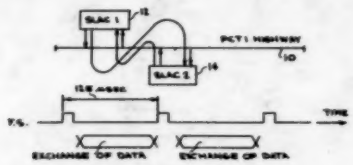
WEAK/STRONG BUS DRIVER

Pierre F. Hauburgin, Austin, Tex., assignor to Advanced Micro Devices, Inc., Sunnyvale, Calif.

Filed Jul. 24, 1987, Ser. No. 77,349

Int. Cl.[5] H03K *19/094*

U.S. Cl. 364—900 **5 Claims**



1. A bus driver circuit for transmitting a series of output bits having two logic levels onto a bus comprising:

a first input terminal for receiving a series of input bits including a first bit, each of said series of input bits having two logic levels;

strong bus driver means (62) coupled to said bus (70);

weak bus driver means (64) coupled to said bus (70);

one of said strong bus driver means and said weak bus driver means being selectably enabled and the other one of said strong bus driver means and said weak bus driver means being selectably disabled for each bit of said series of input bits for generating the series of output bits onto said bus;

detection means (68) responsive to timing signals and an enable signal for generating a signal indicative of the reception of said first bit of said series of input bits to be transmitted;

sensing means (66) for generating a sense signal which is at a first predetermined level when said strong bus driver means (62) is to be enabled and said weak bus driver means (68) is to be disabled and which is at a second predetermined level when said weak bus driver means (64) is to be enabled and said strong bus driver means (62) is to be disabled;

first logic means (72) responsive to said sense signal for selectively enabling and disenabling said strong bus driver means (62) so as to transmit said series of input bits;

second logic means (74) responsive to said sense signal for selectively enabling and disenabling said weak bus driver means (64) so as to transmit said series of input bits;

said first logic means (72) being responsive to said first bit reception signal for initially enabling said strong bus driver means (62) to transmit said first bit of said series of input bits as a first signal of said series of output bits onto said bus;

said second logic means (74) being responsive to said first bit reception signal for initially disabling said weak bus driver means (64);

said sensing means (66) enabling said weak bus driver means (64) and disabling said strong bus driver means (62) when said first signal reaches a selected voltage level defining a current logic level;

said sensing means (66) subsequently comparing the logic level of each subsequent bit in said series of input bits to be transmitted with the corresponding current logic level of the bus and for generating the sense signal of the first predetermined level when the logic level of said each subsequent bit is different from the corresponding current logic level of the bus; and

said sensing means (66) generating said sense signal of the second predetermined level when the logic level of said each subsequent bit is the same as the corresponding current logic level of the bus.

4,941,127

METHOD FOR OPERATING SEMICONDUCTOR MEMORY SYSTEM IN THE STORAGE AND READOUT OF VIDEO SIGNAL DATA

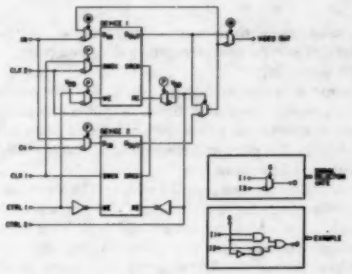
Masashi Hashimoto, Garland, Tex., assignor to Texas Instruments Inc., Dallas, Tex.

Filed Feb. 19, 1988, Ser. No. 158,173

Claims priority, application Japan, Feb. 20, 1987, 62-38630; Aug. 19, 1987, 62-205385

Int. Cl.[5] G11C *11/26*

U.S. Cl. 365—189.01 **2 Claims**



1. A method for operating a video signal memory system in conjunction with a video image display device for producing a substantially flicker-free video image on the display device, said method comprising:

writing first field data into a first memory device having first in—first out data processing capability;

writing second field data into a second memory device having first in—first out data processing capability;

reading out the first line of said first field data from said first memory device while simultaneously writing third field data into said first memory device, wherein the readout

clock rate of said first field data from said first memory device is at a speed twice that of the writing of said third field data into said first memory device;

reading out the first line of said second field data from said second memory device subsequent to the readout of said first line of said first field data from said first memory device but simultaneously with respect to the continued writing of said third field data into said first memory device and at a readout clock rate having a speed twice that of the writing of said third field data into said first memory device; and

continuing the readout of respective lines of said first field data from said first memory device and said second field data from said second memory device in an alternating manner and simultaneous to the continued writing of said third field data into said first memory device at a readout clock rate having a speed twice that of the writing of said third field data into said first memory device until a complete frame of field data is produced as a video image for display on the display device.

4,941,128

SEMICONDUCTOR MEMORY DEVICE HAVING MEANS FOR PROVIDING A PRECHARGE VOLTAGE EQUIVALENT TO A PRESCRIBED SELECTION VOLTAGE

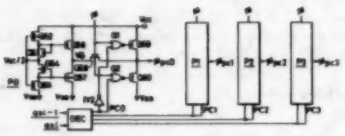
Shouji Wada, Ohme; Nobuo Komatsu, Akishima; Mitsuhiro Takano, Ohme; Sinichi Miyatake, Ohme; Kazuo Mihashi, Akishima, and Hiromi Tsukada, Kokubunji, all of Japan, assignors to Hitachi, Ltd. and Hitachi VLSI Engineering Corp., both of Tokyo, Japan

Filed Apr. 25, 1988, Ser. No. 185,497

Claims priority, application Japan, Apr. 24, 1987, 62-99861; Oct. 28, 1987, 62-272683

Int. Cl.[5] G11C *13/00*

U.S. Cl. 365—203 **9 Claims**



6. A semiconductor memory comprising:

a plurality of first complementary data line pairs;

a first word line;

a first memory mat including a plurality of first memory cells respectively coupled at input/output nodes thereof with one complementary data line among said first complementary data line pairs and coupled at selective nodes thereof with said first word line;

first amplifier circuits coupled with said first complementary data line pairs for applying signals having a predetermined high level and a predetermined low level to said first complementary data line pairs on the basis of storage information of the first memory cells using an intermediate voltage between said predetermined high level and said predetermined low level precharged to said first complementary data line pairs as a reference voltage;

a plurality of first precharge MOSFETs coupled at source-drain paths thereof between said first complementary data lines, respectively,

wherein said first memory mat includes a first signal line coupled with a gate of said first precharge MOSFETs;

a plurality of second complementary data line pairs;

a second word line;

a second memory mat including a plurality of second memory cells respectively coupled at input/output nodes thereof with one complementary data line among said second complementary data line pairs and coupled at selective nodes thereof with said second word line;

second amplifier circuits coupled with said second complementary data line pairs for discriminating information of the second memory cells using a precharge voltage precharged to the complementary data lines as a reference voltage;

a plurality of second precharge MOSFETs coupled at source-drain paths thereof between said second complementary data lines, respectively,

wherein said second memory mat includes a second signal line coupled with a gate of said second precharge MOSFETs;

selecting means coupled with said first and second word lines for selecting one of the first and second word lines; and

control means coupled with said first and second signal lines for respectively applying a voltage substantially equal to the precharge voltage to said first and second signal lines during a predetermined time in response to selection of said semiconductor memory, and for respectively applying a prescribed voltage to render said first or second precharge MOSFETs non-conductive to the signal line in the memory mat having the word line to be selected during the operation of said first or second amplifier circuits.

4,941,129

SEMICONDUCTOR MEMORY DEVICE

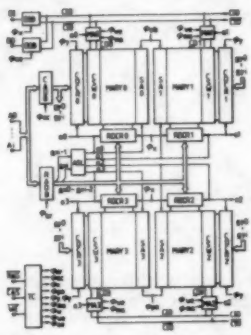
Kazuyoshi Oshima; Takashi Yamazaki, both of Ohme; Yasuhiro Kasama, Tokyo; Tetsu Udagawa, Tokorozawa, and Hiroaki Kotani, Ohme, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Aug. 29, 1988, Ser. No. 237,051

Claims priority, application Japan, Aug. 28, 1987, 62-212722

Int. Cl.[5] G11C *8/00*

U.S. Cl. 365—230.03 **12 Claims**



1. A semiconductor memory device comprising:

a plurality of memory arrays;

array selection means for receiving a predetermined address signal and for selectively generating an array selection signal to select a predetermined one of said memory arrays;

row and column address decoders disposed in such a manner as to respectively correspond to said memory arrays;

a plurality of amplifiers disposed in such a manner as to respectively correspond to said memory arrays; and

selecting means for generating a signal to selectively operate, in accordance with said array selection signal, a predetermined one of said row address decoders corresponding to said selected memory array, a predetermined one of said column address decoders corresponding to said se-

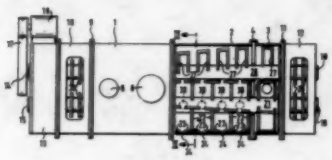
lected memory array, and a predetermined one of said amplifiers corresponding to said selected memory array.

4,941,130

MULTI-SPINDLE KNEADING MIXER WITH FIXED KNEADING COUNTERELEMENTS

Heinz List, deceased, late of Pratteln (by Jorg List, executor); Walther Schwenk, Kaiseraugust, and Alfred Kunz, Wittersiwil, all of Switzerland, assignors to List AG, Pratteln, Switzerland

Filed Feb. 15, 1989, Ser. No. 311,110
Claims priority, application Switzerland, Feb. 16, 1988, 00550/88
Int. Cl.[5] B01F 7/04
U.S. Cl. 366—99 5 Claims



1. A multi-spindle kneading mixer for performing mechanical, chemical and thermal processes, which comprises: a housing; at least two axis-parallel, rotating shafts within the housing; radial disk elements on one shaft having an outside diameter; axially aligned kneading bars fastened on the outside diameter of said disk elements, so that gaps exist therebetween; kneading frames on the second shaft and operative to clean the axially aligned kneading bars; kneading counterelements in the housing projecting into said gaps to clean said gaps, wherein the kneading counterelements are kneading hooks which clean the disk elements, increase the kneading effect, and roll the product between the disk elements; wherein intensive full kneading takes place simultaneously with cleaning.

4,941,131

FLUSH FOR FLUID MIXING AND DISPENSING SYSTEM

Robert E. Daly, Davidson; Clifford E. Sloan, Matthews, both of N.C., and Armisticio Z. Sanidad, Cherry Hill, N.J., assignors to Picker International, Inc., Cleveland, Ohio

Filed Jun. 7, 1989, Ser. No. 362,886
Int. Cl.[5] B01F 15/02
U.S. Cl. 366—167 12 Claims

1. A system for mixing first and second fluids, said system comprising:

(a) a reservoir;

(b) a container containing a quantity of said first fluid, said container defining an opening and having a piercable septum sealing said opening;

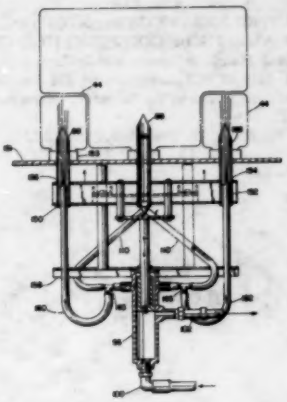
(c) means for supporting said container in an orientation wherein said first fluid is in contact with the inner side of said septum;

(d) a movable tubular piercer mounted for piercing said septum in response to movement of said piercer;

(e) means for causing piercer movement to pierce said septum and to thereby release said first fluid for drainage from said container;

(f) means for directing said first fluid draining from said container into said reservoir;

(g) means for delivering a second fluid to said reservoir;



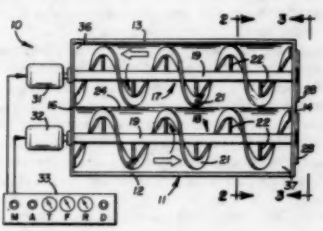
(h) means for directing some of said second fluid through said tubular piercer and into said container for flushing of said container and of surfaces of said piercer.

4,941,132

REVERSING BLENDER AGITATORS

Darrell C. Horn, Lafayette, and John M. Lennox, III, Sebastopol, both of Calif., assignors to Blentech Corporation, Calif.

Filed May 4, 1989, Ser. No. 347,443
Int. Cl.[5] B01F 11/00, 7/08
U.S. Cl. 366—278 21 Claims



1. A method of blending particulated products in a blender tub having first and second opposed ends, said tub having at least one elongated agitator mounted therein for rotation about a horizontal axis, said agitator extending between said opposed ends of said tub and having means for urging products in contact therewith to move towards said first end of said tub in response to rotation of said agitator in a first direction and for urging products in contact therewith to move towards said second end of said tub in response to rotation of said agitator in a second and opposite direction, said method comprising:

(a) putting particulated products in said tub and to a level to be engaged by said agitator,

(b) rotating said agitator in its first direction for a pre-determined length of time,

(c) stopping said agitator,

(d) rotating said agitator in its second direction for a predetermined length of time,

(e) stopping said agitator,

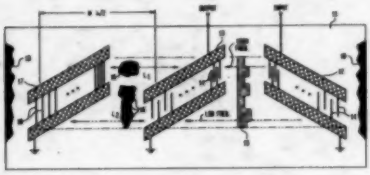
(f) continuously repeating steps (b)–(e) until said particulated products are blended to a desired degree.

4,941,133

SAW SLANTED ARRAY CORRELATOR (SAC) WITH SEPARATE AMPLITUDE COMPENSATION CHANNEL

Elio A. Mariani, Hamilton Square, and William J. Skudera, Jr., Oceanport, both of N.J., assignors to The United States of America as represented by the Secretary of the Army, Washington, D.C.

Filed Jun. 26, 1989, Ser. No. 373,537
Int. Cl.[5] H04R *23/00*
U.S. Cl. 367—140 5 Claims



1. A surface acoustice wave device comprising:

a piezoelectric substrate for prolongating surface acoustic waves;

an input and an output interdigital transducer aligned at predetermined equal and opposite angles to each other; each transducer having a plurality of interdigital electrodes, the periodicity of which varies in a predetermined manner along the length of each transducer, the periodicity variation being the same for corresponding portions of the two transducers;

a reflective array aligned with said interdigital transducers and positioned on said substrate a distance from said output transducer on the side thereof opposite that of said input transducer;

a reflective array aligned with said interdigital transducers and positioned on said substrate a distance from said output transducer on the side thereof opposite that of said input transducer;

said reflective array being disposed on said substrate at an angle the same as that of said output transducer, the distance between the electrodes of said reflective array and the electrodes of said output transducer being equal to $N\lambda/2$, where N is an integer and λ is acoustic wavelength corresponding to the frequency of operation; and

an acoustic absorbing film aligned on said substrate intermediate between said output transducer and said reflective array;

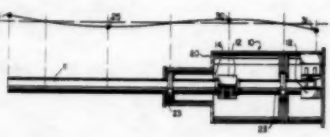
said acoustic absorbing film having a non-uniform width.

4,941,134

SONIC GENERATOR

Christopher A. Nyberg, North Vancouver; James G. Jackson, Burnaby, and Jan Brdicko, West Vancouver, all of Canada, assignors to Arc Sonics Inc., British Columbia, Canada

Filed Apr. 1, 1988, Ser. No. 176,716
Int. Cl.[5] H04R *1/02*
U.S. Cl. 367—142 7 Claims



1. A sonic generator comprising a resonant member having a plurality of nodes and anti-nodes, means located between a housing and said resonant member at at least two nodal locations of said resonant member for substantially isolating the vibration of said member from said housing, said resonant member including a resonant bar and electromagnetic drive means mounted to said resonant bar with drive mounting means, said drive mounting means comprising an outer sleeve surrounding said resonant bar and a resilient elastomeric material between said outer sleeve and said resonant bar, said resilient material having a free surface area and a constrained surface area, said free surface area of said elastomeric material being small relative to said constrained surface area so as to allow said resonant member to freely flex in the characteristic mode shape of said resonant member, said electromagnetic drive means being operable to transmit vibration to said resonant member at a frequency close to or substantially identical with a resonant frequency of said member.

4,941,135

ULTRASONIC FIELD GENERATING DEVICE

Cornelius J. Schram, Pavenham, England, assignor to National Research Development Corporation, London, England

Continuation of Ser. No. 153,832, Jan. 27, 1988, abandoned. This application May 8, 1989, Ser. No. 348,189
Claims priority, application United Kingdom, May 27, 1986, 8612760
Int. Cl.[5] B03B *1/00*; H04R *17/00*
U.S. Cl. 367—150 12 Claims

1. A method of generating an ultrasonic energy field in an enclosed space filled with a fluid medium, comprising the steps of:

disposing an ultrasonic energy source at a spacing from said enclosed space;

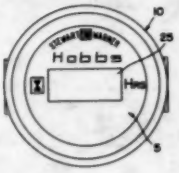
directing a converging ultrasonic energy beam from said source along an axis of propagation extending through said enclosed space; and

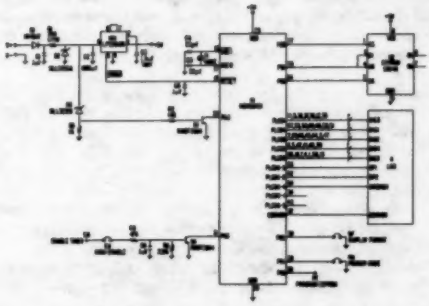
converging said beam from the source through the fluid medium at an angle sufficiently great such that the beam has a cross-sectional area throughout the enclosed space to at least substantially compensate for attenuation of ultrasonic energy in the fluid medium through at least substantially the whole of said enclosed space such that a substantially uniform energy density is created in the said enclosed space.

4,941,136
PROGRAMMABLE HOUR METER FOR RECORDING ELAPSED OPERATION TIME

Edward J. Breitung, II, Springfield, Ill., assignor to Stewart Warner Corporation, Chicago, Ill.

Filed Sep. 13, 1988, Ser. No. 243,919
Int. Cl.[5] G04F 8/00
U.S. Cl. 368—8 12 Claims





1. A programmable elapsed time meter comprising:
an electronic circuit including means for calculating elapsed time, E^2PROM memory means having a plurality of registers for storing the calculated elapsed time, and means for continually updating the the stored calculated elapsed time in said plurality of registers such that no register is updated more than a preselected number of times until all the registers have been updated said preselected number of times;
input terminals for enabling said electronic circuit;
a liquid crystal display connected to said electronic circuit, capable of displaying the elapsed time stored in said electronic circuit; and
a capacitor connected to said electronic circuit for supplying power to said electronic circuit to enable the electronic circuit to update the E^2PROM memory means at power shutdown.

4,941,137
TIMEPIECE WITH MOBILE DECORATIONS

Koji Kikuchi, Tokyo, Japan, assignor to Seikosha Co., Ltd., Japan

Filed Dec. 11, 1989, Ser. No. 449,582
Claims priority, application Japan, Dec. 9, 1988, 63-311614
Int. Cl.[5] G04B 19/00
U.S. Cl. 368—223 2 Claims

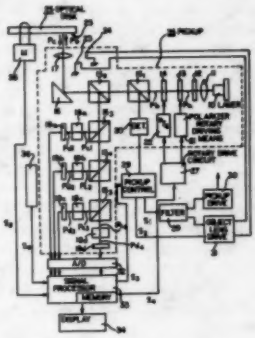
1. A timepiece with mobile decorations, comprising:
a casing incorporating a timepiece movement;
a drive motor encased in said casing and functioning at arbitrarily set hours;
a dial disposed in front of said casing and bilaterally openable and closable about a fixed shaft;
a dial opening/closing mechanism encased in said casing and driven by said drive motor for opening and closing said dial; and

mobile decorations interposed between said dial and a front face of said casing and functioning while said dial is opened so as to be visually recognizable from outside.

4,941,138
METHOD AND AN APPARATUS FOR MEASURING OPTICAL CHARACTERISTICS OF AN OPTICAL DISK

Naomichi Chida, Iruma, and Akiyoshi Watanabe, Kodaira, both of Japan, assignors to Nakamichi Corporation, Kodaira, Japan

Continuation of Ser. No. 109,774, Oct. 16, 1987, abandoned.
This application Jun. 2, 1989, Ser. No. 360,388
Claims priority, application Japan, Oct. 21, 1986, 61-250331; Oct. 21, 1986, 61-250332; Oct. 21, 1986, 61-250333; Nov. 25, 1986, 61-280525; Nov. 25, 1986, 61-280526
Int. Cl.[5] G11B 7/095
U.S. Cl. 369—44.41 6 Claims



1. A method of measuring optical characteristics of a substrate for an optical disk comprising the steps of;
converting a laser light into at least one predetermined polarized light ray selectively;
collecting said polarized light ray into an irradiation light ray to be irradiated onto said optical disk;
controlling a tracking and a focussing of an irradiation point on said optical disk of said irradiation light ray based on a reflection light ray from said optical disk;
dividing said reflection light ray into at least three polarized components;
detecting the light quantity of each of said polarized components;
and measuring polarization characteristics of a substrate for said optical disk based on said light quantity.

4,941,139

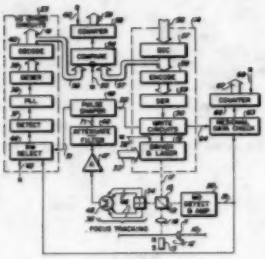
CHECKING MEDIA OPERATIONS AND RECORDING DURING OPTICAL RECORDING

John E. Kulakowski; Rodney J. Means; David M. Oldham, and Morovat Tayefeh, all of Tucson, Ariz., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Sep. 2, 1988, Ser. No. 239,863

Int. Cl.[5] G11B *7/00*

U.S. Cl. 369—54 **6 Claims**



1. In an optical recording apparatus having laser means for supplying a modulated light beam for recording information-bearing signals onto a record member which is relatively moveable with respect to the beam at least along a record track to receive and store said information-bearing signals, optical means optically interposed between said laser means and said record member for directing reflected light from said record member away from said laser means to a first detector, said record member being capable of storing said information-bearing signals as optically-sensible parameter changes of the record member that do not substantially alter the intensity of the reflected light, said record member being responsive to a relatively high-intensity laser beam to record the information-bearing signals;

the improvement, including in combination:

said first detector including means responsive to intensity changes of light reflected from said record member to supply signals indicative of any such intensity changes;

data supply means supplying signals indicative of the information-bearing signals to be recorded, said information-bearing signals being in a predetermined format;

write circuit means coupled to said data supply means and to said laser means for responding to the supplied signals to actuate the laser means to modulate the intensity of its emitted beam directed to the record member via said optical means;

read circuit including light responsive means coupled to said optical means for receiving record medium reflected light for converting signals read from the record member to said predetermined data format;

pulse-shaping means for coupling said first detector to said read circuit means for transferring the intensity-modulated indicating signals to said read circuit means for converting said intensity modulated reflected signals into said predetermined data format and coupled to said write circuit means for shaping and timing said converted intensity modulated indicating signals; and

data comparison means connected to said data supply means and to said read circuit means for comparing the converted signals with the supplied signals and generating a predetermined error indication when the comparison indicates a predetermined difference between the converted and the supplied signals.

4,941,140

OPTICAL DISC PLAYER

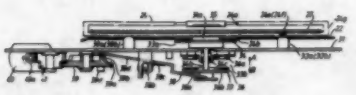
Takuro Ono; Noboru Aoyama, and Kaoru Morinaga, all of Yokohama, Japan, assignors to Kabushiki Kaisha Toshiba, Kanagawa, Japan

Continuation of Ser. No. 89,337, Aug. 25, 1987, Pat. No. 4,914,647. This application Feb. 7, 1989, Ser. No. 306,900

Claims priority, application Japan, Aug. 25, 1986, 61-198426; Aug. 25, 1986, 61-129071

Int. Cl.[5] G11B *17/04, 1/00*

U.S. Cl. 369—264 **3 Claims**



1. A turntable elevation apparatus for an optical disc player, said optical disc player including a disc compartment in a main chassis for accommodating an optical disc case, the optical disc case including an optical disc rotatably disposed therein, the apparatus comprising:

disc holding means for holding the optical disc accommodated in the disc compartment, said disc holding means including turntable means for removably supporting and rotating an optical disc and clamper means for holding the optical disc to said turntable means, said turntable means having a hold position when the optical disc is held between said clamper means and said turntable means and a release position when the optical disc is released by said clamper means and said turntable means;

disc rotation drive means for rotating said turntable means, said disc rotation drive means including a turntable shaft fixed to said turntable means and a motor capable of rotating said turntable shaft, said turntable shaft being translatable along the axis of said turntable shaft to move said turntable means between said hold position and said release position; and

elevator means for controllably elevating said turntable means from said release position to said hold position including a cam member rotatably supported on the main chassis including a gear and a rotary cam, a motor capable of engaging said gear for imparting a rotational movement to said cam member, and an elevation member rotatably supported by said main chassis at a rotation point, said elevation member having a first end in sliding engagement with said rotary cam and a second end in rotatable engagement with said turntable shaft, said elevation member rotating about said rotation point as said cam member rotates thus translating said turntable shaft along the axis of said turntable shaft to move said turntable means between said hold position and said release position.

4,941,141

TIME DIVISION SWITCHING FOR MULTI-CHANNEL CALLS USING TWO TIME SWITCH MEMORIES ACTING AS A FRAME ALIGNER

Shin-ichiro Hayano, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Dec. 29, 1988, Ser. No. 291,673

Claims priority, application Japan, Dec. 29, 1987, 62-336027; Dec. 29, 1987, 62-336028

Int. Cl.[5] H04J *3/02, 3/06*

U.S. Cl. 370—58.1 **9 Claims**

1. A time division switching system for multi-channel calls, comprising:

an incoming highway for supporting an incoming frame having time slots in which signals of said multi-channel calls are carried;

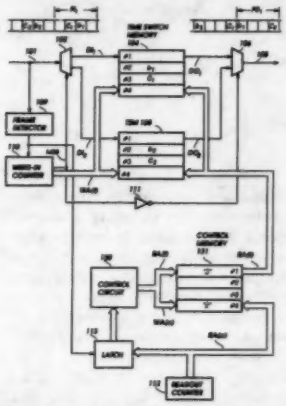
an outgoing highway for supporting an outgoing frame

having time slots in which corresponding signals of said multi-channels calls are carried;

first and second time switch memories each having memory locations corresponding to the time slots of each of said incoming and outgoing frames;

phase detector means for detecting a phase difference between said incoming and outgoing frames; and

control means for writing signals on said incoming highway into one of said first and second time switch memories and



reading signals from the other time switch memory into specified time slots of said outgoing highway in accordance with said phase difference and control data specifying addresses of said first and second time switch memories so that the beginning of said outgoing frame coincides with the one of said time slots of said incoming frame which is displaced from the beginning of said incoming frame by an amount equal to said detected phase difference.

4,941,142

FRAME ERASING METHOD FOR TOKEN RING NETWORKS WITHOUT LAST FRAME INDICATION WITHIN THE FRAME FORMAT

Yasushi Kida, Osaka, Japan, assignor to Sumitomo Electric Industries, Ltd., Osaka, Japan

Filed Jan. 31, 1989, Ser. No. 304,243

Claims priority, application Japan, Feb. 8, 1988, 63-27254

Int. Cl.[5] H04J *3/14*

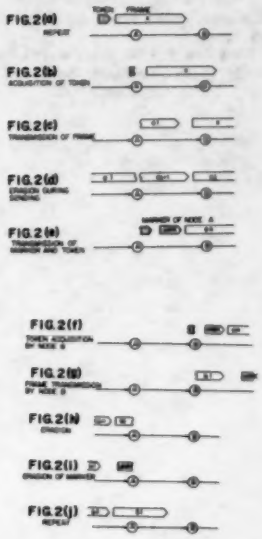
U.S. Cl. 370—85.5 **3 Claims**

1. In a token ring transmission method wherein a plurality of nodes are interconnected in a ring form by a transmission path through which information are sent as information frames in one direction, a right-to-send in said transmission path is obtained by a sender node of said nodes, which sender node holds a token to be sent to said transmission path, and the format of said frames does not have any field to indicate the last frame sent in each capture of said token, the improvement comprising the steps of:

additionally sending an identification frame specific to said sender node from said sender node to the downstream node after information frames were sent from said sender node to said downstream node;

sending said token from said sender node to said downstream node after said identification frame specific to said sender node was sent;

at said sender node, erasing said frames that have traveled round said transmission path and returned to said sender node, irrespective of source address of said frames and without relaying said frames to said downstream node; and



when said sender node detected said specific identification frame, stopping said erasing step.

4,941,143

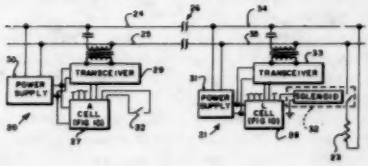
PROTOCOL FOR NETWORK HAVING A PLURALITY OF INTELLIGENT CELLS

William B. Twitty, Santa Cruz, and Wendell B. Sander, Los Gatos, both of Calif., assignors to Echelon Systems Corp., Los Gatos, Calif.

Division of Ser. No. 119,382, Nov. 10, 1987, abandoned. This application Nov. 8, 1988, Ser. No. 268,482

Int. Cl.[5] H04J *3/26*

U.S. Cl. 370—85.2 **2 Claims**



1. In a network for sensing, communicating and controlling having a plurality of cells a method for infering a collision has occurred between packets transmitted by said cells comprising the steps of:

transmitting a first packet by a first of said cells, said first packet requesting a reply from at least a second cell and a third cell;

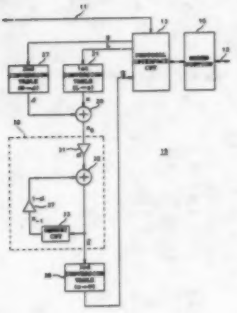
waiting a predetermined period of time for a reply from said second cell and said third cell;

infering that a collision has occurred if a reply is not received from either said second cell or said third cell.

4,941,144
DATA TRANSMISSION DEVICE CAPABLE OF ADAPTIVELY VARYING A PACKET SIZE WITHOUT AN INCREASE IN HARDWARE

Toshihiko Mizukami, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 6, 1988, Ser. No. 202,291
Claims priority, application Japan, Jun. 5, 1987, 62-140103
Int. Cl.[5] G08C 25/02
U.S. Cl. 371—5.5 4 Claims



1. A data transmission device for use in transmitting a transmission data packet in response to an input data signal in accordance with a predetermined protocol such that said transmission data packet can be automatically repeated on nonreception of said transmission data packet at another end coupled to said data transmission device through a transmission line and is variable in a packet size with reference to a bit error rate on said transmission line, said transmission data packet carrying said input data signal having a data size shorter than said packet size, said data transmission device comprising:

protocol interface means response to said input data signal and a size control signal and controllably operable in accordance with said predetermined protocol for producing a repetition number signal representative of a repetition number of said transmission data packet and a size signal representative of a selected one of said data size and said packet size;

a first conversion table coupled to said protocol interface means and responsive to said repetition number signal converting said repetition number signal into a first factor signal related to said bit error rate;

a second conversion table coupled to said protocol interface means and responsive to said size signal converting said size signal into a second factor signal representative of a correction factor dependent on a selected size;

processing means coupled to said first and said second conversion tables for processing said first and said second factor signals to produce a third factor signal representative of an estimation value determined in relation to said bit error rate and said correction factor;

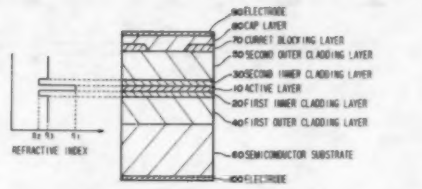
a third conversion table coupled to said processing means converting said third factor signal into a fourth factor signal related to a selected one of said packet size and said data size; and

means for supplying said fourth factor signal to said protocol interface means as said size control signal.

4,941,146
SEMICONDUCTOR LASER DEVICE

Kenichi Kobayashi, Tokyo, Japan, assignor to NEC Corporation, Tokyo, Japan

Filed Jun. 28, 1989, Ser. No. 372,593
Claims priority, application Japan, Jun. 29, 1988, 63-164034
Int. Cl.[5] H01S 3/19
U.S. Cl. 372—45 2 Claims



1. A semiconductor laser device, comprising:

a double heterostructure including an active layer and first and second inner cladding layers provided on both sides of said active layer, said double heterostructure being provided on a semiconductor substrate and a bandgap energy of said first and second inner cladding layers being greater than that of said active layer;

first and second outer cladding layers provided on both sides of said double heterostructure; and

first and second electrodes for applying a predetermined voltage across said double heterostructure;

wherein a refractive index of said active layer is greater than a refractive index of said first and second outer cladding layers, and said refractive index of said first and second outer cladding layers is greater than a refractive index of said first and second inner cladding layers

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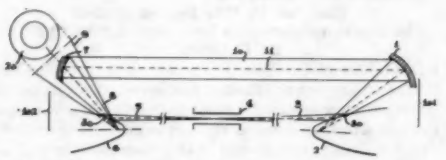
4,941,147
RING RESONATORS WITH INTRACAVITY GRAZING INCIDENCE TELESCOPES

Anup Bhowmik, Westlake Village, Calif., assignor to Rockwell International Corporation, El Segundo, Calif.

Filed Sep. 28, 1989, Ser. No. 413,796
Int. Cl.[5] H01S 3/083
U.S. Cl. 372—94 19 Claims



1. An unstable ring resonator with grazing incidence telescopes consisting of.

a laser beam having a diameter,

a grazing incidence beam reduction telescope which reduces the laser beam diameter and redirects the laser beam through a wiggler,

a grazing incidence beam expansion telescope which enlarges the diameter of the laser beam exiting the wiggler,

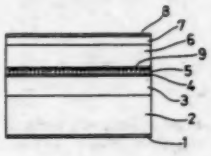
a means of outcoupling a portion of the expanded laser beam from the beam expansion telescope in an unstable ring resonator,

a means of directing the laser beam exiting the grazing incidence beam expansion telescope so that it enters the grazing incidence beam reduction telescope.

4,941,148
SEMICONDUCTOR LASER ELEMENT WITH A SINGLE LONGITUDINAL OSCILLATION MODE

Toshihiko Yoshida, Tenri; Haruhisa Takiguchi; Shinji Kaneiwa, both of Nara, and Hiroaki Kudo, Tenri, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Filed Nov. 12, 1987, Ser. No. 119,780
Claims priority, application Japan, Nov. 12, 1986, 61-270571
Int. Cl.[5] H01S 3/08, 3/19
U.S. Cl. 372—96 38 Claims

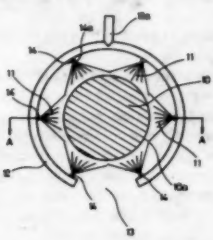


1. A distributed feedback semiconductor laser device comprising:
- a substrate;
- a first clad layer formed on a top surface of said substrate;
- an active layer formed on said first clad layer;
- a second clad layer formed on said active layer;
- a plurality of high resistance regions formed in said second clad layer, each said plurality of high resistance regions being separated by a predetermined lateral distance and extending into said second clad layer a predetermined vertical depth;
- a third clad layer formed over said second clad layer and said plurality of high resistance regions;
- a contact layer formed on said third clad layer;
- a first electrode formed on a bottom surface of said substrate;
- a second electrode formed on said contact layer; and
- current injection means for injecting current into the distributed feedback semiconductor laser device so that the distributed feedback semiconductor laser device oscillates in a single longitudinal mode.

4,941,149
METHOD OF MELTING AND/OR REFINING METALS AND COOLING DEVICE FOR THE GRAPHITE ELECTRODE USED FOR THE SAME

Yakka Nakamoto, Tokyo, and Toshihiko Mori, Toyama, both of Japan, assignors to Nippon Carbon Co., Ltd., Tokyo, Japan

PCT No. PCT/JP87/00415, § 371 Date Aug. 15, 1988, § 102(e) Date Aug. 15, 1988, PCT Pub. No. WO88/07315, PCT Pub. Date Sep. 22, 1988
PCT Filed Jun. 24, 1987, Ser. No. 231,819
Claims priority, application Japan, Mar. 17, 1987, 62-063304
Int. Cl.[5] H05B 7/12
U.S. Cl. 373—96 10 Claims

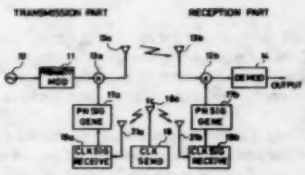


1. A method of melting and/or refining metal by using an electric arc furnace having a vessel for melting and/or refining said metal, a furnace cover covering an upper open portion of said vessel, a vertical succession of graphite electrodes extending into said vessel through said furnace cover and an electrode holder for holding an upper end portion of an upper electrode of said vertical succession of graphite electrodes, said method comprising:
- jetting a liquid coolant against an outer peripheral portion of said upper electrode extending between said furnace cover and said electrode holder while directing the jetted liquid coolant in a downwardly inclined direction at an angle of 10°–35° with respect to the horizontal.

4,941,150
SPREAD SPECTRUM COMMUNICATION SYSTEM

Yoshiki Iwasaki, Yokohama, Japan, assignor to Victor Company of Japan, Ltd., Kanagawa, Japan

Filed May 5, 1988, Ser. No. 190,525
Claims priority, application Japan, May 6, 1987, 62-110135
Int. Cl.[5] H04K 1/10
U.S. Cl. 375—1 28 Claims



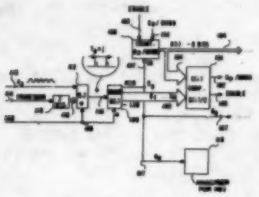
10. A spread spectrum communication system comprising a pair of a transmission part and a reception part; the transmission part of the pair comprising;
- first means for extracting a plurality of first carrier signals from predetermined broadcast waves of existing broadcast systems;
- second means for combining said plurality of the first carrier signals into each other;
- third means for producing a first clock signal of a predetermined frequency from the combined first carrier signals using the combined first carrier signals as frequency references;
- fourth means for generating a first psuedo-noise signal responsive to said first clock signal; and
- fifth means for modulating an information signal and broadening a frequency range of the modulated information signal responsive to the first pseudo-noise signal supplied from the fourth means; and

the reception part of the pair comprising;
- sixth means for extracting a plurality of second carrier signals from said predetermined broadcast waves, frequencies of the plurality of the second carrier signals being respectively identical to the plurality of the first carrier signals;
- seventh means for combining said plurality of the second carrier signals with each other;
- eighth means for producing a second clock signal of said predetermined frequency from the combined second carrier signals using the combined second carrier signals as frequency references;
- ninth means for generating a second pseudo-noise signal from said second clock signal supplied from the eighth means, a pattern of the second pseudo-noise signal being identical to that of the first pseudo-noise signal; and
- tenth means for subjecting the received information signal from the transmission part to despread and demodulating the despread information signal by using the second pseudo-noise signal to reproduce the information signal in an original form.

4,941,151
PREDICTIVE CLOCK RECOVERY CIRCUIT

Jean-Claude Abbiate, LaGaude; Alain Blanc, Vence; Patrick Jeanniot, and Eric Lallemand, both of LaGaude, all of France, assignors to International Business Corporation, Armonk, N.Y.

Filed Oct. 3, 1988, Ser. No. 252,303
Claims priority, application European Pat. Off., Oct. 19, 1987, 87480014
Int. Cl.[5] H04L 7/033
U.S. Cl. 375—20 13 Claims



1. A circuit arrangement for extracting a clock signal from a multi-level digital signal comprising:

a first means for monitoring the multi-level digital signal and for detecting transitions within said multi-level digital signal;

a second means responsive to a first and second consecutive detected transitions, for generating a first count N(i) representative of a time duration between said first and said second consecutive detected transitions;

a third means coupled to the second means, said third means receiving the count N(i) and generating a second count (N(i)/n, with n being an integer;

a fourth means coupled to the second means; said fourth means being operable for generating a third count K(i) representative of one-half time durtion between a third and a fourth consecutive detected transitions;

a fifth means having a first set of inputs for receiving the count N(i)/n and a second set of inputs for receiving the count K(i); said fifth means being operable for analyzing N(i)/n and K(i) and outputting control signals which are received in the fourth means to selectively adjust K(i); and

a sixth means coupled to the fourth means; said sixth means having a set of inputs for receiving output signals representative of a count from said fourth means and generating a SPL pulse when said count is decremented to a predetermined value thereby indicating that the SPL pulse is positioned at the center of the eye intervals of the multi-level digital signal.

4,941,152
SIGNAL CODING PROCESS AND SYSTEM FOR IMPLEMENTING SAID PROCESS

Yoav Medan, Haifa, Israel, assignor to International Business Machines Corp., Armonk, N.Y.

Filed Aug. 22, 1986, Ser. No. 899,261
Claims priority, application Israel, Sep. 3, 1985, 76283
Int. Cl.[5] H04B 14/06
U.S. Cl. 375—27 13 Claims

1. A process for coding a time-varying signal the spectrum of which extends over a given frequency band comprising the steps:

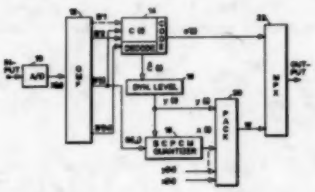
periodically sampling and digitizing the time-varying signal; dividing the digitized samples into fixed length blocks of contiguous samples;

filtering each said block of digitized samples to split at least a portion of the frequency band included in the said block into a number, N, of frequency subbands;

measuring the signal energy Ei, where i=1,2 . . . , N, contained within each of the N individual subbands within the blocks of digitized samples;

measuring the total signal energy within the blocks of digitized samples;

determining the number of quantizing levels q(i), where



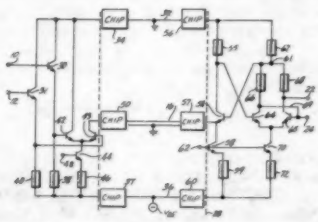
i=1,2, . . . ,N, to be dynamically assigned for quantizing each subband of a block of samples based on the signal energy E(i) of each subband verses the total signal energy in the block of samples; and

quantizing the each subband (i) using a number of quantizing levels equal to q(i).

4,941,153
HIGH-SPEED DIGITAL DATA COMMUNICATION SYSTEM

Edwin A. Kelley, and Wade J. Stone, both of Los Angeles, Calif., assignors to Hughes Aircraft Company, Los Angeles, Calif.

Filed Aug. 25, 1987, Ser. No. 89,281
Int. Cl.[5] H04B 3/50
U.S. Cl. 375—36 7 Claims



1. A high speed digital data communication system comprising:

a source of a digital signal representative of data to be transmitted;

a current mode driver switch for generating a current reponse to the source signal representative of the data;

a transmission line having an input terminal and an output terminal;

means for connecting the switch to the input terminal of the transmission line;

a receiving circuit responding to the current amplitudes and having an input terminal wherein said receiving circuit comprises an approximately constant voltage source and a transistor connected in a common base configuration, the emitter of the transistor being connected to the output terminal of the transmission line and the base of the transistor being connected to the constant voltage source, whereby the transistor input impedance functions as the termination to the transmission line;

means for terminating said transmission line; and

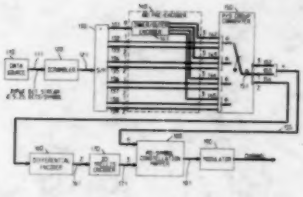
means for connecting the output terminal of the transmission line to the input terminal of the receiving circuit.

4,941,154

TRELLIS CODING METHOD AND ARRANGEMENT FOR FRACTIONAL BIT RATES

Lee-Fang Wei, Lincroft, N.J., assignor to AT&T Bell Laboratories, Murray Hill, N.J.

Filed May 30, 1989, Ser. No. 358,221
Int. Cl.[5] H04R 14/02
U.S. Cl. 375—39 36 Claims



9. A method for encoding, into 2N-dimensional symbols, N being an integer, a stream of input bits occurring at a fractional bit rate of r bits per 2N-dimensional symbol relative to a predetermined symbol rate, said 2N-dimensional symbols being selected from a 2N-dimensional constellation comprised of a concatenation of N/M 2M-dimensional constellations each of which is partitioned into a plurality of 2M-dimensional subsets of signal points, the method comprising the steps of

encoding first ones of the input bits to identify a sequence of 2M-dimensional subsets, and

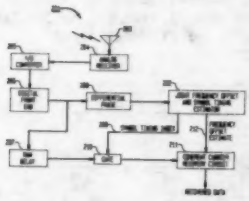
identifying signal points from successive ones of the identified 2M-dimensional subsets jointly in response to at least a particular group of the others of the input bits, said particular bit group being associated with at least L 2N-dimensional symbol intervals, L being an integer greater than unity.

4,941,155

METHOD AND CIRCUITRY FOR SYMBOL TIMING AND FREQUENCY OFFSET ESTIMATION IN TIME DIVISION MULTIPLE ACCESS RADIO SYSTEMS

Justin C. Chuang, Eatontown, and Nelson R. Sollenberger, Tinton Falls, both of N.J., assignors to Bell Communications Research, Inc., Livingston, N.J.

Filed Nov. 16, 1989, Ser. No. 437,758
Int. Cl.[5] H03D 3/22
U.S. Cl. 375—84 30 Claims



1. A method of determining symbol timing in the processing of a digital phase modulated radio signal transmission consisting of sequential bursts of symbols, comprising the steps of:

converting an intermediate frequency (IF) radio signal from a modulated sinusoid into phase values after sampling said IF radio signal at a plurality of sampling times per symbol at a sampling rate which is a multiple of the symbol rate by at least a factor of four;

obtaining differential phase values at each sampling time from said phase values by introducing at least a one symbol delay and taking differences between delayed phase values and corresponding presedt phase values;

collapsing said differential phase values into one quadrant in the phase plane;

expanding said collapsed differential phase values into a full 360 degree polar phase plane; and

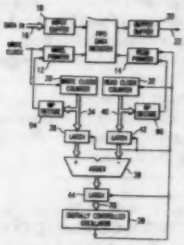
obtaining symbol timing by selecting from amongst the set of sampling times the particular sampling time at which the vector sum of the collapsed and expanded differential phase values, substantially over an entire burst, has the largest magnitude.

4,941,156

LINEAR JITTER ATTENUATOR

Kenneth J. Stern, and John A. Beck, both of Austin, Tex., assignors to Crystal Semiconductor, Austin, Tex.

Continuation-in-part of Ser. No. 51,985, May 19, 1987, Pat. No. 4,805,198. This application Mar. 22, 1989, Ser. No. 327,027
Int. Cl.[5] H04L 7/02
U.S. Cl. 375—118 21 Claims



1. A jitter attenuator for attenuating jitter on a received clock and associated data, comprising:

an elastic store device for receiving the data for storage therein at the clock rate of the received clock, which received clock comprises a Write clock, and outputting data at a rate determined by a Read clock;

difference means for determining the phase difference between said Write clock and said Read clock;

clock generating means for generating said Read clock, said Read clock variable in discrete substantially equal steps in response to a digital input signal; and

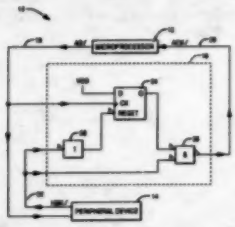
digital lock means for generating the digital input signal for controlling the frequency of said Read clock in said discrete steps to maintain said phase difference at a static phase difference, each of said discrete steps corresponding to a finite amount of said phase difference, the magnitude of the variation in frequency of said Read clock being a function of the amount that the magnitude of said phase difference, as determined by said difference means, varies from said static difference, said lock means operable to attenuate phase variations of said Read clock relative to phase variations in said Write clock;

said lock means substantially linearizing the variations of said clock generating means with respect to said phase difference, such that a change in said phase difference results in a corresponding and substantially linear variation in the frequency of said clock generating means over the range of said clock generating means.

4,941,157
SLOW PERIPHERAL HANDSHAKE INTERFACE CIRCUIT

Billy K. Taylor, Columbia, S.C., assignor to NCR Corporation, Dayton, Ohio

Filed Apr. 14, 1989, Ser. No. 338,832
Int. Cl.[5] H04B 17/00
U.S. Cl. 375—121 21 Claims



14. An interface circuit between a requesting device and a responding device comprising:

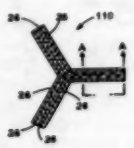
means for receiving a request signal from said request device and a handshake signal from said responding device and generating a control signal in response thereto, wherein removal of said request signal sets said control signal to a first value and removal of said handshake signal resets said control signal to a second value; and

a gate for generating an acknowledge signal, said gate having a first input connected to receive said control signal and a second input for receiving said handshake signal, said gate being disabled when said control signal is set to said first value and being enabled when said control signal is reset to said second value.

4,941,158
NUCLEAR REACTIVITY CONTROL CONFIGURATION

Billy E. Bingham, and Richard V. DeMarr, both of Lynchburg, Va., assignors to The Babcock & Wilcox Company, New Orleans, La.

Filed Mar. 30, 1989, Ser. No. 330,410
Int. Cl.[5] G21C 7/10
U.S. Cl. 376—332 1 Claim



1. A neutron flux control component assembly for use in a nuclear reactor, comprising:

a. at least three V-shaped close fitting carrier sheets nested together to provide a Y-shaped cross section and which are movable relative to each other along their longitudinal axis;

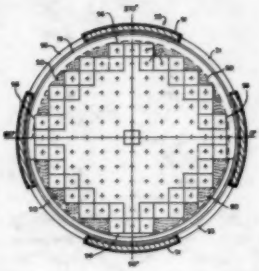
b. at least three substantially identical neutron poison segments, one on each of said carrier sheets, movable between overlapped and exposed positions in response to movement of said carrier sheets; and

c. each of said poison segments having a width greater than three times the effective thickness of the assembly of overlapping poison segments and capable of absorbing at least eighty percent of the neutrons that strike its surface.

4,941,159
LOW NEUTRON FLUENCE NUCLEAR REACTOR INTERNALS

Richard E. Schwirian, Pleasant Hills, and Vincent A. Perone, Murrysville, both of Pa., assignors to Westinghouse Electric Corp., Pittsburgh, Pa.

Filed Oct. 14, 1988, Ser. No. 257,917
Int. Cl.[5] G21C 15/10, 11/06
U.S. Cl. 376—458 16 Claims



1. In a nuclear reactor pressure vessel having a core made of generally rectangular components surrounded by a generally cylindrical core barrel to thereby define an irregular area therebetween such that some regions of the core are closer to the core barrel than others, an assembly for reducing the fast neutron flux encountered by the reactor vessel, said fast neutron flux reducer comprising:

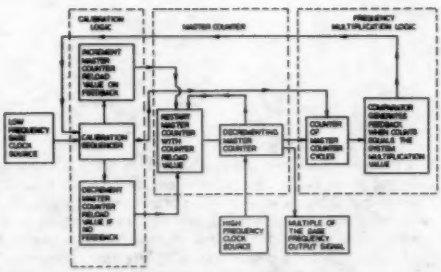
i. a neutron reflector comprised of a plurality of stacked plates situated in the irregular area between the core and the core barrel for reflecting fast neutrons back into the core, the neutron reflector located in the irregular area wherein said regions of the core are closer to the core barrel is made of material selected from the group consisting of tungsten and zirconium oxide, and the reflector located in the remainder of the irregular area is made of stainless steel; and

ii. a neutron energy reducer disposed around the periphery of the core barrel for reducing the energy of any fast neutrons which pass through said neutron reflector.

4,941,160
FREQUENCY MULTIPLIER CIRCUITRY AND METHOD

Thomas J. Sheahan, Cary, Ill., assignor to Digital Appliance Controls, Inc., Hoffman Estates, Ill.

Filed Mar. 31, 1989, Ser. No. 331,733
Int. Cl.[5] H03K 21/40
U.S. Cl. 377—28 6 Claims



1. A frequency multiplying circuit comprising:

a first signal source having a first frequency;

a second signal source having a second frequency;

first counter means arranged to count cycles of said second frequency source, said counter operating to count from a loaded value and then to reset at the end of said count;

means to generate an output signal each time said first counter resets, the frequency of said output signal being a multiple of said frequency of said first signal; and

correction means arranged to monitor said frequency of said output and to change said loaded value in response thereto, wherein said correction means includes second counter means arranged to count cycles of said first counter means and further includes means to change said loaded value in response to the timing of said counted cycles.

4,941,161

DETECTION OF DIGITAL SIGNAL ERROR RATES

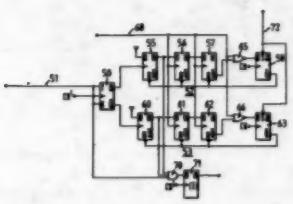
Thomas Cook, Corstorphine, England, assignor to Hewlett-Packard Company, Palo Alto, Calif.

Continuation of Ser. No. 101,051, Sep. 25, 1987, abandoned. This application Dec. 6, 1989, Ser. No. 449,368

Claims priority, application European Pat. Off., Apr. 14, 1987, 87303258

Int. Cl.[5] H03K 21/40; G06F 11/00

U.S. Cl. 377—28 **9 Claims**



1. Apparatus for detecting X characteristic bits occurring within any N-bit window in a digital stream of bits, wherein X and N are predetermined, comprising:

a plurality (X−1) of counting means each for counting at least N bits in the digital stream when active, including means for resetting each counting means to an inactive state after counting N bits;

activation means for activating one of the (X−1) counting means upon the occurrence of a characteristic bit within the digital stream, and for successively activating next ones of the (X−1) counting means upon the occurrence of each next characteristic bit in modulo fashion, whereby, after a last one of the (X−1) counting means has been activated, a first one of the (X−1) counting means is activated; and,

test means operatively coupled to the counting means and coupled to receive each characteristic bit for indicating when a characteristic bit occurs while all counting means are active.

4,941,162

METHOD AND SYSTEM FOR DETECTION OF NITROGENOUS EXPLOSIVES BY USING NUCLEAR RESONANCE ABSORPTION

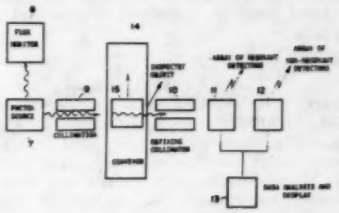
David Vartsky, Rehovot; Mark Goldberg, Rehovot; Amos Breskin, Rehovot; Gideon Engler, Rehovot; Aharon Goldschmidt, Nes Ziona; Ephraim Izak, Rishon Le-Zion, and Ovadia Even, Givataim, all of Israel, assignors to The State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, Yavne, Israel

Filed Jun. 22, 1989, Ser. No. 369,230

Claims priority, application Israel, Jun. 22, 1988, 86826

Int. Cl.[5] G01N 23/04

U.S. Cl. 378—3 **8 Claims**



1. A method for the detection of a nitrogenous explosive material in an object, comprising:

(i) placing on one side of the object a source for 9.17 MeV γ-rays adapted to produce a desired photon flux (emitted photon flux);

(ii) placing on the opposite side of the object a γ-ray detector or array of detectors with a nitrogen rich detection medium;

(iii) scanning the object with a γ-ray beam from said source;

(iv) reading from said γ-ray detector or array of detectors the total and the non-resonant attenuations of the incident photon flux; and

(v) deriving from said attenuations the net resonant attenuation and the spatial distribution thereof.

4,941,163

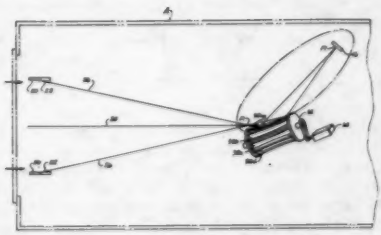
MULTISPECTRAL GLANCING INCIDENCE X-RAY TELESCOPE

Richard B. Hoover, Huntsville, Ala., assignor to The United States of America as represented by the Administrator of the National Aeronautics and Space Administration, Washington, D.C.

Filed Aug. 15, 1985, Ser. No. 765,979

Int. Cl.[5] G21K 7/00

U.S. Cl. 378—43 **11 Claims**



7. A method of imaging X-ray and extreme ultraviolet radiation sources over a broadband of wavelengths generally below 30 angstroms with a high-resolution which comprises the steps of:

providing a glancing incidence primary mirror system for reflecting a radiation beam of said radiation source toward a primary focus of the primary optical system located on an optical axis of said optical system;

arranging an ellipsoidal mirror along said optical axis behind said primary focus at an inclination to said optical axis so that a first focus of said ellipsoidal mirror is coincident with said primary focus of said optical system and a second focus of said ellipsoidal mirror is coincident with said primary focus of said ellipsoidal mirror lies off said optical axis;

arranging an X-ray detector at said second focus of said ellipsoidal mirror;

providing said ellipsoidal mirror in the form of a mirror element having a concave surface with a layered synthetic microstructure coating on said concave surface to reflect a desired wavelength within said broadband of low wavelengths.

4,941,164

METHOD AND APPARATUS FOR IMPROVING THE ALIGNMENT OF RADIOGRAPHIC IMAGES

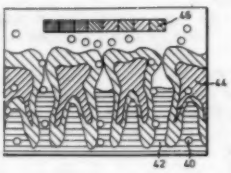
Paul D. Schuller, Edmonton, Canada; David C. Hatcher, Sacremento, Calif.; Terrance M. Caelli, Edmonton, Canada; Frank M. Eggert, Edmonton, Canada, and Jerome Yuzyk, Edmonton, Canada, assignors to The Governors of the University of Alberta, Edmonton, Canada

Filed Jan. 29, 1988, Ser. No. 150,242

Claims priority, application Canada, Oct. 29, 1987, 550585

Int. Cl.[5] A61B *6/08*

U.S. Cl. 378—205 **13 Claims**



5. For a diagnostic process in which two radiographic images are made on radiographic film of the same human tissues within or close to the teeth at the beginning and the end of a time interval during which tissue change may occur, a bite block for permitting a computing device which electronically stores the images to perform operations on the images as reproduced in the form of pixels on a monitor screen, each pixel having a specific grey level, the bite block registering repeatedly with the same teeth of a given person and incorporating a specific, 3-dimensional spatial pattern of spherical marker elements so that when the bite block is held between the given person's teeth the elements will have a specific and repeatable juxtaposition with respect to the dental structure and the shadows of the elements will arise on the respective radiographic films.

4,941,165

HOT CUT PROCEDURE FOR TELECOMMUNICATIONS NETWORK

Kevin A. Rademacher, Lakeville; Dennis R. Dean, Eden Prairie; Jerry L. Dixon, Sr., Burnsville, and Robert J. Szklarz, Richfield, all of Minn., assignors to ADC Telecommunications, Inc., Minneapolis, Minn.

Filed Jun. 29, 1989, Ser. No. 374,076

Int. Cl.[5] H04B *3/50*

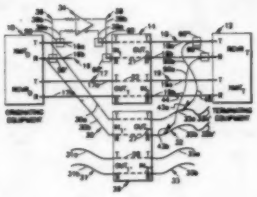
U.S. Cl. 379—1 **12 Claims**

1. In a telecommunications network having at least first and second original equipment connected by at least a first original conductor, a method for adding an additional equipment to said network with said additional equipment connected to said first original equipment by at least a first replacement conductor and said additional equipment connected to said second original equipment by at least a second replacement conductor, said method carried out using a temporary circuit having at least first and second temporary conductors, said method comprising the steps:

electrically connecting said first and second replacement conductors to said additional equipment;

electrically connecting said first temporary conductor to said original conductor at a first point of connection;

electrically connecting said second temporary conductor to said original conductor at a second point of connection, said second point of connection disposed between said



second original equipment and said first point of connection, said first and second temporary conductors and at least a portion of said first original conductor cooperating to define a temporary signal pathway between said first and second original equipment with said temporary signal pathway including said temporary circuit;

severing said original conductor at a point of severance disposed between said first and second points of connection;

electrically connecting said first replacement conductor to said first original equipment;

electrically connecting said second replacement conductor to said second original equipment; and

severing said temporary signal pathway.

4,941,166

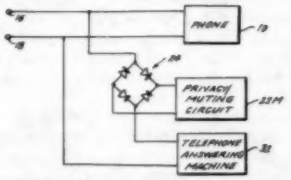
MUTING CIRCUIT FOR TELEPHONE ANSWERING MACHINE

Herbert H. Waldman, 1739 52nd St., and Kalman Drebin, 1683 54th St., both of Brooklyn, N.Y. 11204

Continuation-in-part of Ser. No. 596,357, Apr. 3, 1984, Pat. No. 4,726,048. This application Jan. 4, 1988, Ser. No. 140,386

Int. Cl.[5] H04M *1/65*

U.S. Cl. 379—67 **28 Claims**



1. Apparatus, comprising:

an answering machine which plays out a greeting message over a telephone line to which it is coupled in response to an incoming call; and

a voltage breakdown circuit coupled in series between a subcircuit of said answering machine and said telephone line, said voltage breakdown circuit becoming conductive

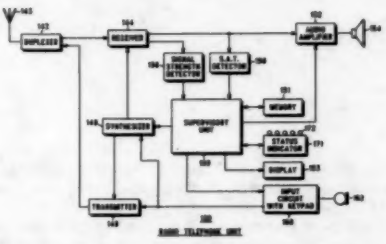
only when the voltage across said telephone line exceeds a predetermined threshold level.

4,941,167

TELEPHONE SYSTEM WITH CUSTOMIZED CENTRAL MESSAGE CENTER

Gary A. Cannalte, Hoffman Estates; Todd Smith, Long Grove; William F. Zancho, Hawthorn Woods, and Robert J. Crawford, Palatine, all of Ill., assignors to Motorola, Inc., Schaumburg, Ill.

Filed Nov. 4, 1988, Ser. No. 267,484
Int. Cl.[5] H04M *1/57, 1/64, 11/08*
U.S. Cl. 379—67 **5 Claims**



1. A telephone communications system, comprising:

switch control means for intercoupling a plurality of telephone devices and for activating at least one prerecorded message of a plurality of prerecorded messages in response to initiated telephone calls, including:

means for providing at least one prerecorded message, wherein one of the prerecorded messages is a help message for access by a first telephone device;

means for providing telephone call transfers from the first telephone device to a second telephone device; and

means for communicating data to the second telephone device;

the first telephone device having means for designating a prerecorded message at the means for providing prerecorded messages; and

the second telephone device having means for indicating, in response to a telephone call transfer from the first telephone device and in response to data from the means for communicating data, a prerecorded message designated by the means for designating a prerecorded message.

4,941,168

SYSTEM FOR THE RECOGNITION OF AUTOMATED TELEPHONE ANSWERING DEVICES AND DELIVERY OF PRERECORDED MESSAGES TO SUCH DEVICES

Joseph J. Kelly, Jr., Joplin, Mo., assignor to U.S. Telecom International Inc., Joplin, Mo.

Filed Sep. 21, 1988, Ser. No. 247,200
Int. Cl.[5] H04M *3/46*
U.S. Cl. 379—69 **23 Claims**

1. An improved automated telephone dialing and message delivery system, comprising:

means for automatically dialing a telephone number over a communication channel so as to establish a communications channel with a called telephone;

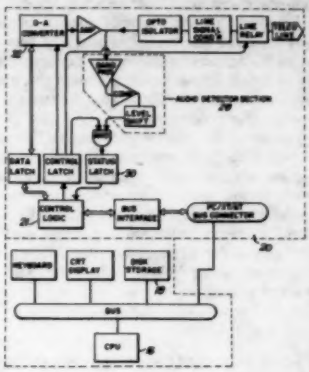
means for detecting a presence or absence of an audio signal over the communications channel emanating from the called telephone;

means for providing audio instructions to the called telephone after the presence of an audio signal is detected emanating from the called telephone;

means for determining if the audio instructions are acknowledged by a party at the called telephone;

means for providing audio messages to a live party when audio instructions are acknowledged;

means for delivery of messages to a telephone answering device when audio instructions are not acknowledged,



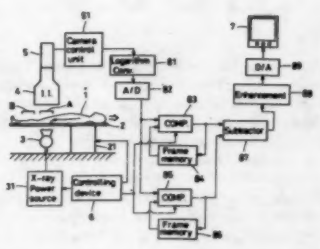
including means for detecting the absence of any audio signal emanating from the called telephone and means for providing audio messages to the telephone answering device when no audio signal is emanating from the called telephone.

4,941,169

X-RAY PHOTOGRAPHIC EQUIPMENT

Masumi Kawai, and Hiroshi Sawada, both of Kyoto, Japan, assignors to Shimadzu Corporation, Kyoto, Japan

Filed Dec. 20, 1988, Ser. No. 286,825
Claims priority, application Japan, Jul. 31, 1987, 62-193248
Int. Cl.[5] H05G *1/64*
U.S. Cl. 378—99 **11 Claims**



1. In an X-ray photographic equipment having image producing means for producing an image signal representing an image of a body of a subject from X-rays passing through the body, said equipment having moving means for producing relative movement between the image producing means and the body of the subject in the direction of flow of a contrast medium through the body, the improvement comprising:

control means for stopping said moving means at one of a plurality of positions and, while said moving means is stopped at said one position, repeatedly energizing said image producing means whereby a plurality of image signals each representing an image of said body, are produced;

means responsive to said image producing means for digitizing said image signals to produce frames of digitized

image signals representing levels of pixels in said images ranging from black to white;

first frame memory means initially storing a frame image wherein the pixels are all of the black level;

second frame memory means initially storing a frame image wherein the pixels are all of the white level;

means responsive to said control means for comparing, pixel-by-pixel a frame image in said first frame memory means with a frame of digitized image signals and returning to said first frame memory means the pixels which comparison shows to be the whitest, to thereby develop a maximum value holding image;

means responsive to said control means for comparing, pixel-by-pixel, a frame image in said second frame memory means with a frame of digitized image signals and returning to said second frame memory means the pixels which the comparison shows to be the blackest, to thereby develop a minimum value holding image; and,

difference means for determining the difference between said minimum value holding image and said maximum value holding image.

4,941,170

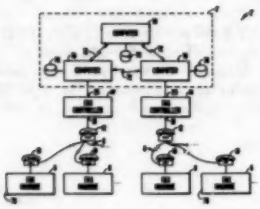
FACSIMILE TRANSMISSIONS SYSTEM

Noel M. Herbst, Menlo Park, Calif., assignor to Tandem Computers Incorporated, Cupertino, Calif.

Continuation of Ser. No. 122,569, Nov. 16, 1987, abandoned, which is a continuation of Ser. No. 825,001, Jan. 30, 1986, abandoned. This application Mar. 20, 1989, Ser. No. 326,407

Int. Cl.[5] **H04M** *11/00*; **H04N** *1/21, 1/32*

U.S. Cl. 379—100 **31 Claims**



1. An apparatus for transmitting document facsimile data through a conventional text electronic mail system using conventional facsimile machines coupled to one another through a communication network, the electronic mail system being of the type wherein text messages including a first destination address for a first I/O device are input to the electronic mail system at a second I/O device and communicated to the first destination address as packages of binary encoded text characters by the electronic mail system, the apparatus comprising:

receiving means for receiving the document facsimile data from a transmitting facsimile machine, the document facsimile data including:

a first document sheet having coding thereon identifying the first document sheet as containing document facsimile data for the first destination address; and

a second document sheet containing facsimile data to be transmitted to the first destination address;

first blocking means, responsive to the receiving means, for converting the coding in the first document sheet into a first block having bytes identifying the first destination address;

second blocking means, responsive to the receiving means, for converting the second document sheet into a second block comprising binary encoded facsimile data, the second block including a plurality of binary encoded fields forming a record which identifies the second block; and

wherein the electronic mail system includes:

grouping means, responsive to the first blocking means and to the second blocking means, for logically grouping the first and second blocks together as a package.

4,941,171

ELECTRONIC PRIVATE BRANCH EXCHANGE

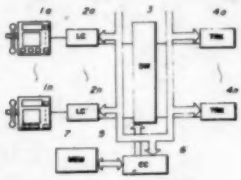
Iwao Hasegawa, Tachikawa, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Dec. 22, 1988, Ser. No. 288,194

Claims priority, application Japan, Jan. 6, 1988, 63-827

Int. Cl.[5] **H04M** *3/02*

U.S. Cl. 379—233 **10 Claims**



9. An electronic private branch exchange comprising:

a plurality of main wire trunks corresponding to a plurality of main wires respectively;

a plurality of line circuits corresponding to a plurality of extension telephone sets respectively, each said extension telephone set having a time period zone during which each said telephone set responds to an incoming call from the main wire;

incoming signal control means for putting particular ones of the plurality of extension telephone sets in corresponding relationships to each of the main wire trunks and for causing an incoming signal from that main wire trunk to be responded to at the particular extension telephone sets;

means for setting a final time period zone in which an incoming signal tone is to be produced at particular ones of the extension telephone sets by a comparison between a predetermined time period zone and a modification time period zone from certain ones of the extension telephone sets; and

means for sending a signal to the particular extension telephone sets to produce an incoming signal tone at those extension telephone sets in the final time period zone set by the setting means.

4,941,172

PREPROGRAMMED AUTODIALER AND RELATED PROCESS

Jacob J. Wiseburn, Washington, D.C.; Alan J. Rider, and Lester R. Querry, both of Reston, Va., assignors to U.S. News, Washington, D.C.

Continuation-in-part of Ser. No. 124,579, Nov. 24, 1987, Pat. No. 4,817,135. This application Feb. 9, 1989, Ser. No. 307,941

The portion of the term of this patent subsequent to Mar. 28, 2006, has been disclaimed.

Int. Cl.[5] **H04M** *1/26*

U.S. Cl. 379—355 **45 Claims**

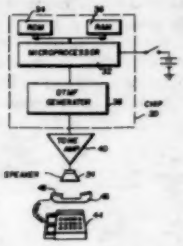
1. A thin, pocket size automatic dialer comprising:

a portable housing having a bottom wall, peripheral sidewall and top wall;

an automatic dialing device mounted within said housing including means for dialing only a single preprogrammed telephone number associated with a source of goods or services, said means including a speaker adjacent one end of said housing for acoustically coupling said dialing device to a telephone microphone, and wherein speaker holes are provided in said bottom wall adjacent said speaker;

a power source for supplying power to said dialing device, and

a single switch mounted in said housing adjacent the other end of said housing and accessible through an aperture in



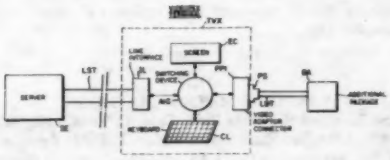
said top wall of said housing for actuating said dialing device.

4,941,173

DEVICE AND METHOD TO RENDER SECURE THE TRANSFER OF DATA BETWEEN A VIDEOTEX TERMINAL AND A SERVER

Jean-Pierre Boule, 12 rue de la Résistance, 14540 Soliers, France; Dominique Hamel, 37 rue Lanfranc, 14000 Caen, France; and Martial Menconi, Résidence Olympia, 14000 Caen, France

Filed Nov. 10, 1988, Ser. No. 269,592
Claims priority, application France, Nov. 13, 1987, 87 15718
Int. Cl.[5] H04R *1/00*
U.S. Cl. 380—25 **15 Claims**



1. Exchanging data device comprising:

(a) a videotex terminal having a switching control device, a line interface, a keyboard, a screen, a downstream video adapter connector and a power supply,

(b) a package connected to said video adapter connector of said videotex terminal, said package comprising first encryption/decryption means and first dialogue means constituted by:

(i) a central processing unit acting as a microcontroller and having a transmission terminal and a receiving terminal connected to said switching control device of said videotex terminal,

(ii) first storage means storing at least one encryption/decryption algorithm, at least one part of a basic key, a confidential code, and an authentication package code,

(iii) voltage supplying means connected to said power supply of said videotex terminal,

(c) a server comprising second encryption/decryption means and second dialogue means, constituted by second storage means storing said at least one encryption/decryption algorithm, at least one part of said basic key, and a server authentication code.

(d) a telematic line connecting said videotex terminal and said server through said line interface of said videotex terminal,

(e) said first and second encryption/decryption means of said package and said server and said first and second dialogue means of said package and said server operative in a first presession mode and in a second session mode subsequent to said presession mode,

(f) wherein said presession mode includes:

(i) carrying out a predetermined sequence of operations including inputting of said confidential code by a user via said keyboard of said videotex terminal, checking said confidential code in said package for validity, carrying out mutual authentication validity checks between said package and said server using said package and server authentication codes,

(ii) sending from said server to said package a session key ciphered according to said basic key, said session key being then stored in said first storage means of said package, said central processing unit of said package acting on said switching control device of said videotex terminal to inhibit a linking between said keyboard and said line interface of said videotex terminal and monitoring any action on said switching control device having an origin external to said package, any such action leading to the presession mode being aborted,

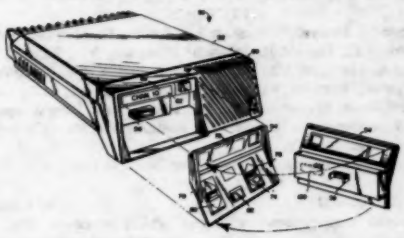
(g) said session mode including exchanging messages ciphered/deciphered according to said session key.

4,941,174

DIGITAL RADIO WITH SECURITY SYSTEM FOR SELECTIVELY ENABLING SOFTWARE CONTROLLED OPTIONS

Scott W. Ingham, Forrest, Va., assignor to General Electric Company, Lynchburg, Va.

Filed Apr. 19, 1988, Ser. No. 183,212
Int. Cl.[5] H04K *1/00*
U.S. Cl. 380—52 **11 Claims**



1. An escutcheon plate module adapted for connection to a digital radio transceiver of the type which generates clock synchronization signals and applies said clock synchronization signals to an electrical connector, said module comprising:

connection means for separable engaging with said digital radio transceiver connector;

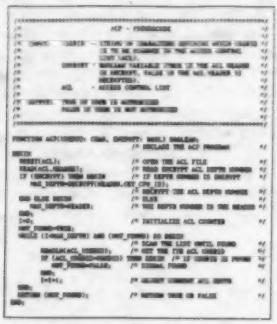
user control means connected to said connection means for applying control signals to said connection means in response to user manipulation thereof; and

security circuit means connected to receive said clock synchronization signals via said connection means for applying a predictable sequence of serial output signals to said connection means in timed relation with the occurrence of said clock synchronization signals.

4,941,175
TAMPER-RESISTANT METHOD FOR AUTHORIZING ACCESS TO DATA BETWEEN A HOST AND A PREDETERMINED NUMBER OF ATTACHED WORKSTATIONS

Michael A. Enescu, Sunnyvale, and James Lum, Redwood City, both of Calif., assignors to International Business Machines Corporation, Armonk, N.Y.

Filed Feb. 24, 1989, Ser. No. 315,071
Int. Cl.[5] H04L 9/00
U.S. Cl. 380—4 **7 Claims**



1. A method for authorizing access to application software resident in a CPU host from among N < M workstations or users communicatively attaching said CPU host, said CPU manifesting indicia of identity, comprising the steps of:

(a) forming a list of authorized users and encrypting thereon a depth parameter N, said encryption using a function of the CPU identity and an offset as a key;

(b) responsive to each application software access request from among the workstations or users, accessing the list and decrypting the depth parameter N with the key; and

(c) scanning the list within the depth N and returning an access authorization to the requester only upon an identity

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4,941,176
SECURE MANAGEMENT OF KEYS USING CONTROL VECTORS

Stephen M. Matyas, Manassas, Va.; Dennis G. Abraham, Concord, N.C.; Donald B. Johnson, Manassas, Va.; Ramesh K. Karne, Herndon, Va.; An V. Le, Arlington, Va.; Rostislaw Prymak, Dumfries, Va.; Julian Thomas, Lagrange, N.Y.; John D. Wilkins, Somerville, Va., and Phil C. Yeh, Poughkeepsie, N.Y., assignors to International Business Machines Corporation, Armonk, N.Y.

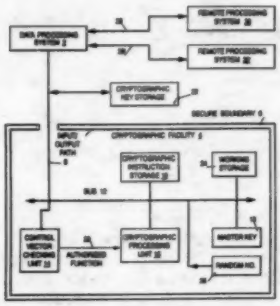
Filed Aug. 11, 1988, Ser. No. 231,114
Int. Cl.[5] H04K 1/00
U.S. Cl. 380—21 **67 Claims**

1. In a data processing system which processes cryptographic service requests for the management of cryptographic keys which are associated with control vectors defining the functions which each key is allowed by its originator to perform, an apparatus for validating that key management functions requested for a crytographic key have been authorized by the originator of the key, comprising:

a crytographic facility characterized by a secure boundary through which passes an input path for receiving said cryptographic service requests, cryptographic keys and their associated control vectors, and an output path for providing responses thereto, there being included within said boundary a cryptographic control means coupled to said input path, a control vector checking means and a cryptographic processing means coupled to said control means, and a master key storage coupled to said processing means, for providing a secure location for executing key management functions in response to said received service requests;

said cryptographic control means receiving over said input path a cryptographic service request for performing a key management function with a cryptographic key;

said control vector checking means having an input coupled to said input path for receiving a control vector associated with said cryptographic key and an input coupled to said cryptographic, control means for receiving control signals



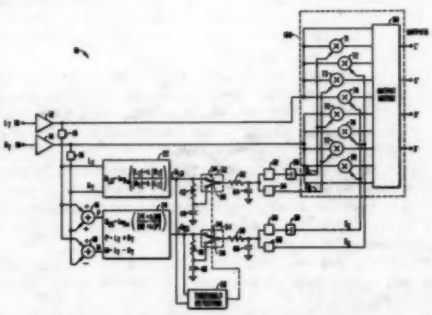
to initiate checking that said control vector authorizes the key management function which is requested by said cryptographic service request;

said control vector checking means having an authorization output coupled to an input of said cryptographic processing means, for signalling that said key management function is authorized, the receipt of which by said cryptographic processing means initiates the performance of the requested key management function with said cryptographic key.

4,941,177
VARIABLE MATRIX DECODER

Douglas E. Mandell, Menlo Park; Craig C. Todd, Mill Valley; Ioan R. Allen, San Francisco, and Mark F. Davis, Pacifica, all of Calif., assignors to Dolby Laboratories Licensing Corporation, San Francisco, Calif.

Continuation of Ser. No. 833,120, Feb. 26, 1986, Pat. No. 4,799,260, which is a continuation-in-part of Ser. No. 708,982, Mar. 7, 1985, abandoned. This application Jul. 22, 1988, Ser. No. 222,847
The portion of the term of this patent subsequent to Jan. 17, 2006, has been disclaimed.
Int. Cl.[5] H04S 3/00
U.S. Cl. 381—22 **38 Claims**



1. A decoder for decoding two or more channel signals in a directional information system wherein at least four input

signals containing directional information are encoded into the two or more channel signals, said decoder comprising:

first means for generating at least a first dominance signal indicative of the ratio of the amplitudes of a pair of the channel signals;

second means for generating at least a second dominance signal indicative of the ratio of the amplitudes of the sum of and the difference between said pair of the channel signals; and

matrix means responsive to said two or more channel signals and to said at least two dominance signals for generating a plurality of output signals for which directional effects of the output signals are enhanced, wherein the first dominance signal D_{LR} and the second dominance signal D_{CS} are given by:

$$D_{LR} = \log_a \frac{|L_T| + k|R_T|}{|R_T| + k|L_T|}$$

$$D_{CS} = \log_a \frac{|P| + k|M|}{|M| + k|P|}$$

where L_T, R_T are two channel signals

$P = L_T + R_T$; $M = L_T - R_T$;

and a, k are constants;

wherein said matrix means includes means for deriving three directional control signals E_L, E_R and E_C.

4,941,178

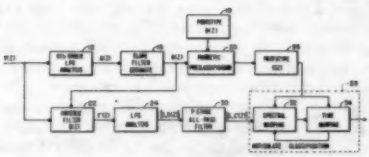
SPEECH RECOGNITION USING PRECLASSIFICATION AND SPECTRAL NORMALIZATION

Chiu-Kuang Chuang, Lexington, Mass., assignor to GTE Laboratories Incorporated, Waltham, Mass.

Continuation of Ser. No. 846,939, Apr. 1, 1986, abandoned. This application May 9, 1989, Ser. No. 349,877

Int. Cl.[5] G10L *5/00*

U.S. Cl. 381—41 **51 Claims**



1. A speech recognition system for recognizing units of speech input comprising:

means for generating first speech vectors characteristic of units of a speech input;

means for comparing the first speech vectors with first reference vectors corresponding to a set of reference speech units and for selecting a limited subset of the reference speech units for which the first reference vectors have the closest correspondence with the first speech vectors;

means for generating second speech vectors characteristic of units of speech input normalized with respect to the first speech vectors; and

means, responsive to the means for comparing the first speech vectors and to the means for generating the second speech vectors, for comparing the second speech vectors to second reference vectors corresponding to the selected subset of speech units and for selecting a speech unit of the subset for which the second reference vectors have the closest correspondence with the second speech vectors.

4,941,179

METHOD FOR THE REGULATION OF A HEARING AID, A HEARING AID AND THE USE THEREOF

Hans Bergenstoff, and Torsten Otto, both of Hillerod, Denmark, assignors to GN Davavox A/S, Copenhagen SV, Denmark

Continuation-in-part of Ser. No. 804,054, Dec. 3, 1985, abandoned. This application Apr. 27, 1988, Ser. No. 186,930

Int. Cl.[5] H04R *25/00*; H03G *5/02, 5/14*

U.S. Cl. 381—68.4 **2 Claims**

1. A hearing aid comprising:

a sound inlet with sound detector;

an adjustable electronic analog amplification circuit including a pre-amplifier and an output amplifier;

a sound reproducer;

a regulation part including first regulation means for adjusting the frequency response of the amplification circuit, the regulation part arranged for finger operation at any time thereby allowing the user to directly gradually adjust the amplifier's frequency response slope for frequencies above a transition frequency and for frequencies in an amplitude range above a frequency independent amplitude setting so that the variable treble boost is obtained according to the user's individual needs and acceptance;

where said transition frequency is between 500 Hz–2 Khz;

wherein said regulation part includes second regulation means arranged to regulate the basic amplification of the amplifier circuit in a substantially frequency independent manner and

wherein said regulation part further includes a third-order filter, the third-order filter comprising a resistor-capacitor network and an amplification circuit with a feedback path which contains an additional amplifier, wherein the third-order filter determines the frequency response and thus determines the degree of variable treble boost.

4,941,180

HEARING AID WITH A CONTACT SPRING CONFIGURATION

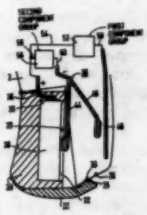
Gerhard Buettner, Grossenseebach, Fed. Rep. of Germany, assignor to Siemens Aktiengesellschaft, Berlin and Munich, Fed. Rep. of Germany

Filed Jul. 15, 1987, Ser. No. 73,537

Claims priority, application Fed. Rep. of Germany, Jul. 21, 1986, 3624568; Jul. 21, 1986, 3624588; Jul. 21, 1986, 3624619

Int. Cl.[5] H04R *25/00*

U.S. Cl. 381—69.2 **20 Claims**



1. A miniature hearing aid comprising:

(a) a hearing aid housing;

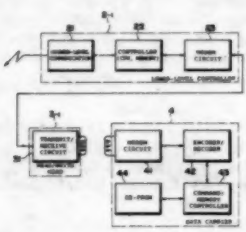
(b) electrical components disposed in said hearing aid housing;
(c) a compartment for retaining a battery, said compartment being hinged to said hearing aid housing;
(d) a latching means for said battery compartment, said latching means comprising
(d1) a latch-notch mechanism disposed on said hearing aid housing and
(d2) a clasp which is disposed on said battery compartment and which juts over a base of said hearing aid housing
whereby said latching means enables said hearing aid to assume a plurality of switching positions in different latching positions of said latching means; and
(e) a contact spring means disposed in said battery compartment, which contact spring means presses against said battery retained in said battery compartment with differing resiliencies dependent on varying switching positions of said battery compartment assumed in different latching positions of said latching means, wherein a single variable contact within said contact spring means can be selectively disposed in one of three switching positions, whereby all of said electrical components are electrically connected to said battery in the first switching position, only a part of said electrical components are electrically connected to said battery in the second switching position, and all of said electrical components are electrically disconnected from said battery in the third switching position.

4,941,181

DATA PROCESSING METHOD IN RECOGNITION SYSTEM

Kimio Igarashi, Gozen; Yasuo Uchida, Takatsuki, and Kenji Matsui, Nagaokakyo, all of Japan, assignors to Omron Tateisi Electronics Co., Kyoto, Japan

Filed May 2, 1989, Ser. No. 346,659
Claims priority, application Japan, May 9, 1988, 63-111859
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 **3 Claims**



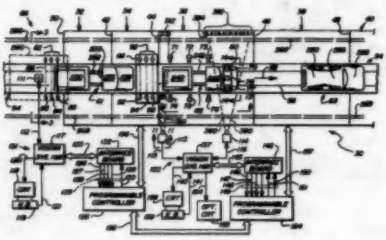
1. A data processing method in a recognition system including a data carrier having a memory integrated therewith to store identification data therein, said data carrier being mounted on a moving article, a higher-level controller, a plurality of lower-level controllers connected to the higher-level controller each for receiving a command from the higher-level controller so as to control data access to the memory of the data carrier, and at least a read/write head connected to each said lower-level controller for effecting data communication with the data carrier approaching the read/write head characterized in that:
the higher-level controller specifies the lower-level controllers in a predetermined order so as to sequentially send thereto an auto read/write command and thereafter specifies the lower-level controllers in a predetermined order so as to sequentially send a sub-command thereto;
that each said lower-level controller receiving the auto read/write command with a specification thereto repeatedly sends a command to confirm an approach of the data carrier until the approach of the data carrier is confirmed such that when the approach of the data carrier is confirmed, said lower-level controller sends the auto read/-write command;
that the data carrier effects an access to a memory in response to the auto read/write command thus received so as to transmit an auto response related to the access to the memory to the lower-level controller; and
that the lower-level controller keeps the content of the auto response such that when the sub-command with a specification thereof from the higher-level controller is received, the lower-level controller sends the auto response including the content thus kept to the higher-level controller.

4,941,182

VISION SYSTEM AND METHOD FOR AUTOMATED PAINTING EQUIPMENT

Parashar Patel, Mount Clemens, Mich., assignor to Phoenix Software Development Co., Sterling Heights, Mich.

Filed Jul. 29, 1987, Ser. No. 79,304
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—1 **47 Claims**



1. Vision apparatus for automated painting equipment, comprising:
(a) at least one camera means for acquiring successive images of a first scene from a first portion of the painting equipment including at least a first movable object to be identified via selected pictorial attributes thereof; and
(b) an image analysis system for digitally processing successive images received from said camera means, said system including (1) means for recognizing selected pictorial attributes of the first object when such attributes are present in at least one of the successive images (2) means for comparing the recognized attributes of the first object with corresponding reference data from a first set of information previously stored in the system, and (3) means for identifying the first object as being present in the first scene when a match within a predetermined first tolerance exists between at least one of the recognized pictorial attributes and corresponding reference data from the first set of information.

4,941,183

METHOD AND APPARATUS FOR OPTIMIZING THE CUTTING OF MATERIAL

Wolfgang Bruder, Bielefeld, and Klaus Biervert, Spenge, both of Fed. Rep. of Germany, assignors to Durkopp System Technik GmbH, Fed. Rep. of Germany

Filed Jul. 8, 1987, Ser. No. 70,902
Claims priority, application Fed. Rep. of Germany, Aug. 6, 1986, 3627110
Int. Cl.[5] G06K 9/00
U.S. Cl. 382—8 **19 Claims**

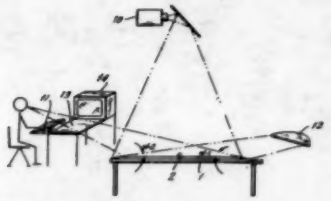
1. A method of optimizing the cutting out of pieces of mate-

rial having predetermined shapes from a workpiece such as leather, patterned fabric or the like, comprising the steps of:

(a) preparing reduced-scale templates corresponding to the shapes of the pieces to be cut out;

(b) placing the templates on a projection device and projecting images of the templates onto the material to be cut, such that images of the templates appear on the workpiece and have the full size of the pieces to be cut out;

(c) then, manually positioning the templates on the projection device while observing their images projected onto the workpiece, to optimize the positioning of the templates, giving due consideration to the imperfections and structural features of the particular workpiece to be cut, and selecting a final position of the templates;



(d) generating digital template data representative of the shape of each individual template and its position on the projection device;

(e) calculating the total area of the cut pieces on the basis of the digital template data;

(f) comparing the total area of the cut pieces with the total area of the workpiece and thereby determining a degree of utilization of the workpiece material;

(g) if said degree of utilization is substantially optimal, generating a start command for causing a cutting device to carry out the cutting according to the template images on the workpiece;

(h) if said degree of utilization is not substantially optimal, repeating steps (b)–(g).

4,941,184

IMAGE-PROCESSING SYSTEM WITH CHARACTER READER AND AN IMAGE-PROCESSING METHOD

Toyoshi Sato, Tokyo, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan

Filed Aug. 1, 1988, Ser. No. 226,471

Claims priority, application Japan, Aug. 13, 1987, 62-202382

Int. Cl.[5] G06K 9/00

U.S. Cl. 382—17 **14 Claims**

1. A character reader comprising:

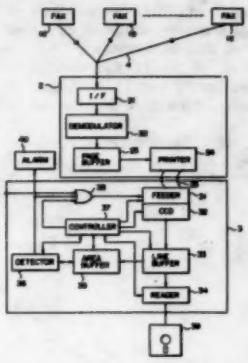
receiving means for receiving an image of a slip obtained through photoelectric conversion from an apparatus connected through communication lines, said slip having a print area printed in a predetermined drop-out color and a predetermined format, characters being entered in said slip in conformity to said format;

image memory means coupled to said receiving means for storing an image received by said receiving means and represented by a plurality of dots;

character reader means coupled to said image memory means for reading out characters contained in the image stored in said image memory means;

drop-out determination means coupled to said image memory means for effecting a check as to whether said drop-out color has been dropped out at the time of said photoelectric conversion according to the image of said print area printed in said drop-out color among the image stored in said image memory means; and

control means for stopping a character-reading operation of said character reader means with respect to a slip when said drop-out determination means determines that failure



drop-out of said drop-out color according to the result of determination of said drop-out determination means.

4,941,185

IMAGE PROCESSING

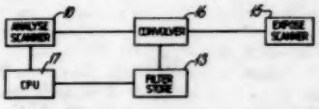
Alastair Reed, Bedfordshire, England, assignor to Crosfield Electronics, London, England

Continuation of Ser. No. 6,841,090, Mar. 13, 1986, abandoned. This application Oct. 6, 1988, Ser. No. 253,913

Claims priority, application United Kingdom, Mar. 18, 1985, 8506931

Int. Cl.[5] G06K 9/36

U.S. Cl. 382—41 **19 Claims**



1. Apparatus for processing a first image represented by digital data and which is a convolution of a second image and a periodic function, to produce said second image, the apparatus comprising means for determining a two-dimensional frequency filter characteristic which suppresses the frequency or frequencies of said periodic function and higher order harmonics of said frequency or frequencies; a store for storing digital data defining said two-dimensional frequency filter characteristic; and control means for applying said two-dimensional frequency filter characteristic to said digital data representing said first image to generate digital data representing said second image.

4,941,186

METHOD AND APPARATUS FOR CONCEALING ERRORS WHICH EXTEND OVER SEVERAL PIXELS IN A DIGITAL VIDEO SIGNAL

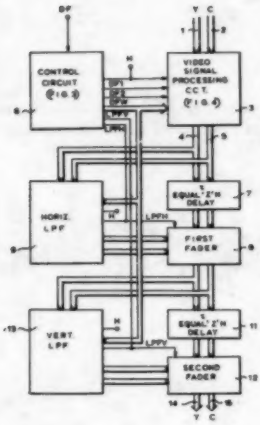
Volker Maasmann, and Dieter Poetsch, both of Ober-Ramstadt, Fed. Rep. of Germany, assignors to Robert Bosch GmbH, Stuttgart, Fed. Rep. of Germany

Continuation of Ser. No. 111,625, Oct. 21, 1987, abandoned. This application Aug. 15, 1989, Ser. No. 395,132

Claims priority, application Fed. Rep. of Germany, Oct. 23, 1986, 3636077

Int. Cl.[5] G06K 9/40

U.S. Cl. 382—54 **11 Claims**



1. Method of concealing errors in a digital video signal by replacing disturbed pixel values with values derived from neighboring undisturbed pixel values, comprising the steps of:

detecting disturbed pixel values in a manner indicating pixel disturbance width (DFW) of a disturbance affecting values of a plurality of adjoining pixels in the same horizontal line as well as indicating pixel disturbance location (DF, DF1, DF2) of said pixels of affected value and

time-expanding the video signal of said same horizontal line outside of and adjacent to said plurality of adjoining pixels of said same line having disturbed values, by inserting in said video signal, between successive pixels of undisturbed value in said same line, interpolated pixel values derived from values of said successive pixels of said same line between which said derived pixel values are inserted, whereby said interpolated pixel values are horizontally interlaced with pixels of undisturbed values, and performing said time-expansion of said video signal in such a measure that a portion of the time-expanded video signal of said same line replaces all successive pixels of disturbed value of a disturbance in said same line for which pixel disturbance with and pixel disturbance location has been detected.

4,941,187

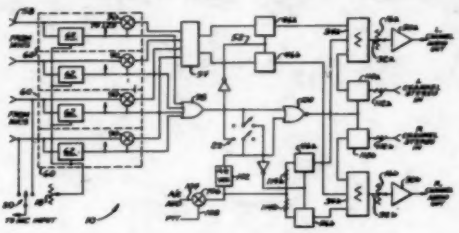
INTERCOM APPARATUS FOR INTEGRATING DISPARATE AUDIO SOURCES FOR USE IN LIGHT AIRCRAFT OR SIMILAR HIGH NOISE ENVIRONMENTS

Robert W. Slater, 48 W. 938 Chandelle Dr., Hampshire, Ill. 60140

Continuation of Ser. No. 134,611, Dec. 15, 1987, abandoned, which is a continuation of Ser. No. 885,331, Jul. 14, 1986, abandoned, which is a continuation of Ser. No. 576,624, Feb. 3, 1984, abandoned. This application Jan. 19, 1989, Ser. No. 300,166

Int. Cl.[5] H04B 1/00

U.S. Cl. 381—86 **16 Claims**



1. Apparatus for integrating disparate audio sources for use in light aircraft or in other high noise environments comprising unitary driver means for generating a composite output signal representative of a driver input signal, audio output means associated with the output of the driver means for connection of a plurality of remote headsets whereby a substantially identical composite output signal will be present at all of the headsets without regard to the source of audio comprising said composite output signal; audio signal summation means operatively connected to the driver input having a plurality of audio inputs for connection of remote microphones, each remote microphone being associated with and proximate to a headset whereby an occupant of the aircraft may speak into a microphone and listen to the composite output signal, including the voice audio of said occupant, through the associated headset, said audio summation means funtioning to combine the respective audio inputs to form a single composite signal; each summation means audio input including an associated audio switch means, audio detector means, and audio input means for connection of an audio input signal thereto; each audio switch means connected in series between the associated summation means audio input and the audio input means, and each audio switch means having a gate means whereby the switch means may be selectively controlled to a first closed-circuit condition whereby an audio input signal at the associated audio input means is substantially connected to the summation means audio input and a second open-circuit condition whereby an audio input signal at the associated audio input means is substantially removed from said audio input; each audio signal detector means being operatively connected to the gate means of the associated switch means and to the associated audio input means, each detector means being unresponsive to audio input signals on other than the associated audio input means, whereby the detector means controls the associated switch means into the first closed-circuit condition whenever an audio input signal of predetermined amplitude is present at the associated audio input means without regard to the input signal condition on any other audio input means and into the second open-circuit condition following a predetermined interval in which an audio input signal at the associated audio input means has not exceeded the predetermined amplitude whereby only audio input signals having a predetermined amplitude contribute to the driver means output signal thereby improving the audio quality by eliminating noise present on unused audio signal inputs.

4,941,188

IMAGE SIGNAL PROCESSING APPARATUS

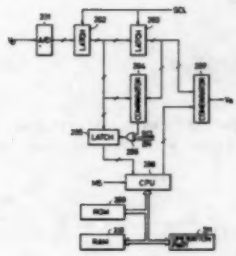
Masanori Yamada, Kawasaki, Japan, assignor to Canon Kabushiki Kaisha, Tokyo, Japan

Continuation of Ser. No. 597,735, Apr. 6, 1984, abandoned. This application Dec. 27, 1988, Ser. No. 289,520

Claims priority, application Japan, Dec. 4, 1983, 58-63013; Dec. 4, 1983, 58-63859

Int. Cl.[5] G06K *9/38*

U.S. Cl. 382—50 **10 Claims**



1. An image signal processing apparatus comprising:

reading means for reading an original image in units of lines;

detecting means for detecting the peak density level of each line read by said reading means and for outputting peak density level data;

storage means for storing plural lines of peak density level data detected by said detecting means; and

processing means for performing an arithmetic operation on the plural lines of peak density level data stored in said storage means, and for performing density correction processing of a target line in accordance with an arithmetic operation result of the arithmetic operation, said processing means performing the density correction processing of the target line, and detection of the plural lines of peak density level data prior to the target line, during a one time reading operation of the original image by said reading means.

4,941,189

OPTICAL CHARACTER READER WITH SKEW RECOGNITION

Ronald H. Britt, Leicester, England, assignor to Landy Electronics & Systems, Inc., Charlotte, N.C.

Division of Ser. No. 18,585, Feb. 25, 1987, Pat. No. 4,876,730. This application Feb. 13, 1989, Ser. No. 310,532

Int. Cl.[5] G06K *9/32*

U.S. Cl. 382—46 **7 Claims**

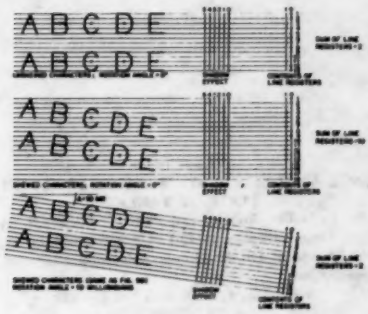
1. An optical character recognition device, for detecting the amount of skew of characters arranged in lines and columns on a document, comprising:

character recognizing means for scanning a document having a plurality of characters arranged in lines and columns on said document, for establishing a single reference point on the document, and for producing, for each recognized character, information indicative of the identity of the recognized characters and the original coordinate positions of each of the recognized characters relative to the said signal reference point on the document;

means for calculating coordinate data of each of said recognized characters by rotating the coordinate position of each of said recognized characters through each of a plurality of rotation angles about the said single reference point;

shadow effect calculation means for calculating the shadowing effect that the coordinate position of each character creates along at least one margin of the document for said plurality of rotation angles including the rotation angle of zero; and

shadow effect detection means for detecting the rotation



angle creating the narrowest shadow effect along said margin of the document, and taking this rotation angle as the angle at which the lines of characters are skewed on the document.

4,941,190

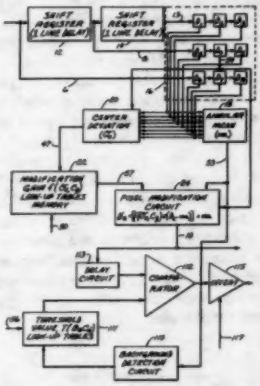
METHOD AND SYSTEM FOR ENHANCEMENT OF A DIGITIZED IMAGE

Terrence H. Joyce, Minneapolis, Minn., assignor to Minnesota Mining and Manufacturing Company, St. Paul, Minn.

Filed Jul. 15, 1988, Ser. No. 219,377

Int. Cl.[5] G06K *9/36*

U.S. Cl. 382—54 **31 Claims**



1. A system for modifying pixels supplied to the system that are multiple level signals for a digitized image including:

means providing a moving pixel window from pixels supplied to the system, said pixel window having a center pixel, D_c and at least 2^N pixels surrounding said center pixel, where N is an integer of 1 or more;

means receiving 2^N pixels of said pixels surrounding said center pixel for providing the annular mean, m_a, of said received 2^N pixels;

means receiving said center pixel and selected for providing an output based on the center deviation σ_c, for said center pixel; and

means connected to said output for obtaining a modification gain, $f(\sigma_c, C_g)$; and

means receiving said center pixel, D_c, said annular means, m_a, and said modification gain, $f(\sigma_c, C_g)$ for providing a modified center pixel, D_c', in accordance with the following equation:

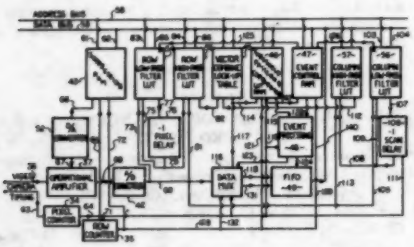
$$D_c' = [f(\sigma_c, C_g) \times (D_c - m_a)] + m_a$$

4,941,191

IMAGE ANALYSIS SYSTEM EMPLOYING FILTER LOOK-UP TABLES

John W. V. Miller, Toledo, and Peter S. Miller, Perrysburg, both of Ohio, assignors to O-I Neg TV Products, Inc. Formerly known as Owens-Illinois Television Products, Inc.), Toledo, Ohio

Filed Jan. 4, 1988, Ser. No. 140,459
Int. Cl.[5] G06K 9/52
U.S. Cl. 382—54 **30 Claims**



8. An image analysis system comprising a camera having a linear array of pixels each providing a signal representing the magnitude of light received from a corresponding discrete area along a band of discrete areas on an object producing said image, means to scan said linear array of pixels for successive adjacent bands of discrete areas on said object producing said image to produce serially a plurality of rows of pixels for said bands in which pixels are arranged in columns in adjacent bands; means to assign a column number to pixels in the same column; high pass row filter means to filter pixel-to-pixel signal intensities in rows; high pass column filter means to filter pixel-to-pixel intensities in columns; and means to vector combine signals as a function of said signals from said row filter means and from said column filter means in a memory having a value for every possible combination of the signals from said row and column filter means.

4,941,192

METHOD AND APPARATUS FOR RECOGNIZING PATTERN OF GRAY LEVEL IMAGE

Tadaaki Mishima, Hitachi; Morio Kanasaki; Masao Takatoo, both of Katsuta, and Hideo Ota, Hitachi, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan

Filed Apr. 19, 1988, Ser. No. 183,689
Claims priority, application Japan, Apr. 20, 1987, 62-97134
Int. Cl.[5] G06K 9/39
U.S. Cl. 382—54 **11 Claims**

1. A method of recognizing a pattern of a gray level image comprising the steps of:

normalizing a gray level image to be processed;

extracting local feature parameters of said normalized gray level image at predetermined sampling points; and

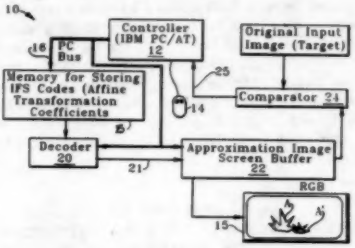
identifying a pattern by using said extracted feature parameters in accordance with a predetermined recognition procedure.

4,941,193

METHODS AND APPARATUS FOR IMAGE COMPRESSION BY ITERATED FUNCTION SYSTEM

Michael F. Barnsley, and Alan D. Sloan, both of Atlanta, Ga., assignors to Iterated Systems, Inc., Norcross, Ga.

Filed Oct. 2, 1987, Ser. No. 104,412
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—56 **69 Claims**



1. A method for compressing images, comprising the steps of:

providing an input image having at least two dimensions;

storing the image in a memory;

displaying the image stored in the memory on a display;

selecting a geometric first region of the image displayed on the display with selecting means;

generating and displaying a contractive copy of the first region in the memory;

storing a set of transformation coefficients corresponding to the transformation creating the contractive copy;

on the display, collaging the transformed contractive copy with respect to the first region to align geometric features of the transformed contractive copy with corresponding geometric features of the first region;

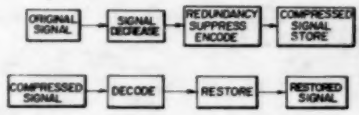
repeating the steps of generating and displaying a contractive copy, storing the transformation coefficients, and collaging the transformed contractive copy until substantially all of the first region is covered by a collage of transformed contractive copies, thereby providing a set of a plurality of transformation coefficients; and

providing as an output a set of iterated function system compression codes corresponding to the set of a plurality of transformation coefficients.

4,941,194
METHOD OF COMPRESSING RADIATION IMAGE SIGNAL

Kazuo Shimura, Kanagawa, Japan, assignor to Fuji Photo Film Co., Ltd., Kanagawa, Japan

Continuation of Ser. No. 12,716, Feb. 5, 1987, abandoned. This application Aug. 24, 1988, Ser. No. 235,767
Claims priority, application Japan, Feb. 5, 1986, 61-23475
Int. Cl.[5] G06K 9/36
U.S. Cl. 382—56 6 Claims



1. A method of compressing radiation image signals representing the picture elements of a radiation image, comprising the steps of:

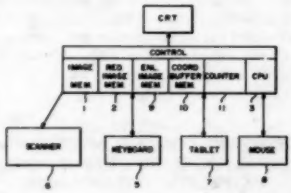
pre-processing said radiation image signals based on the spatial frequency characteristics of said radiation image to produce representative radiation image signals less in number than said image signals representing said radiation image; and

subjecting only said representative image signals to a redundancy suppressing encoding process such that said representative image signals which have undergone said redundancy suppressing encoding process completely define said radiation image.

4,941,195
OPTICAL CHARACTER READER

Hideaki Tanaka, Osaka; Toshiaki Morita, Nara, and Minehiro Konya, Osaka, all of Japan, assignors to Sharp Kabushiki Kaisha, Osaka, Japan

Continuation-in-part of Ser. No. 107,041, Oct. 9, 1987, abandoned. This application Mar. 31, 1989, Ser. No. 333,730
Claims priority, application Japan, Oct. 27, 1986, 61-256074
Int. Cl.[5] G06K 9/20
U.S. Cl. 382—61 1 Claim



1. In an optical character reader adapted to read a document and thereby input image data by a scanner and to recognize said image data within a specified area, the improvement wherein said optical character reader is provided with input means which include

an image memory for storing said image data inputted by said scanner,

inputting means for inputting an enlarged display command and positions of two area setting points,

control means for creating reduced image data by thinning said inputted image data and, if an enlarged display command is inputted, enlarged display data with reference to a cursor position in said image data,

a reduced image memory for storing said reduced image data,

an enlarged display memory for storing said enlarged display data,

display means having a display area for displaying display data which include said reduced image data and said enlarged display data,

cursor moving means for moving a cursor displayed on said display area, and

area setting means for receiving positional data on two specified points inputted through said inputting means and setting on said display area a rectangular target area with a hypotenuse having said two specified two points as the end points thereof,

said control means being capable of

displaying in said display means an entire layout of said inputted image data by using said reduced image data in said reduced image memory,

responding to said enlarged display command inputted from said inputting means by displaying on said display means said enlarged display data in said enlarged display memory,

a first cursor, and

a second cursor, said first and second cursors being displayed at mutually corresponding positions respectively in said enlarged and reduced display data,

moving said second cursor, if said first cursor is moved by said cursor moving means, according to the movement of said first cursor,

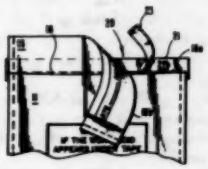
scrolling said enlarged display data on said display means if it is attempted to move said first cursor beyond said display area, and

recognizing only those of said image data in said target area specified through said input means.

4,941,196
TAMPER EVIDENT BAG

Paul F. Edelman, Indianapolis, and Cynthia M. Nulliner, Fairland, both of Ind., assignors to Kel Corporation, Shelbyville, Ind.

Filed Nov. 1, 1988, Ser. No. 265,583
Int. Cl.[5] B65D 27/30
U.S. Cl. 383—5 7 Claims



1. A security bag comprising:

a pair of wall panels, each having a bottom, sides and a top, said wall panels being joined together at said bottoms and said sides and defining an opening at said tops;

one of said wall panels having an extension strip removably connected thereto at said top along a perforation line, said extension strip being removable therefrom by tearing along said perforation line;

a closure flap for closing said opening, said closure flap including;

a strip of tape having adhesive on one side of said strip of tape, said strip of tape being connected at a lower portion of said strip of tape by the adhesive to said one of said wall panels below said perforation line; and

a release liner covering the adhesive on an upper portion of said strip of tape and readily removable therefrom, said release liner positioned between said extension strip and the adhesive and said release liner further positioned between said perforation line and the adhesive on said strip of tape to prevent said strip of tape from attaching to said extension strip;

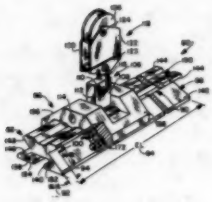
whereby, when said extension strip is removed at said perforation line and when said release liner is removed from said upper portion of said strip of tape, said upper portion can be folded over said opening and attached by the adhesive to the other of said pair of wall panels to close said opening.

4,941,197

ROLLER BEARING DEVICE AND APPARATUS USING SAME

John O. Roeser, Barrington, Ill., assignor to Otto Engineering, Inc., Carpentersville, Ill.

Filed Feb. 27, 1989, Ser. No. 315,908
Int. Cl.[5] F16C 29/06
U.S. Cl. 384—44 **54 Claims**



1. A slide roller bearing apparatus comprising:

(a) a rail track means having a length for receiving roller means for relative moving engagement there along, said rail track means having a first rail track surface means and a second rail track surface means, each of said first and second rail track surface means having a length and a width,

(b) a car means operatively associated with said rail track means for movement relative to the length thereof, said car means having a first car surface means and a second car surface means,

(c) roller means having a length and a diameter disposedly associated with the said rail track means and the said car means to permit rolling movement of said car means relative to the length of said rail means, said roller means having a roller first surface means and a roller second surface means,

(d) attachment means operatively associated with said car means and said rail means whereby said movement of the car means relative to said rail track means may be usefully employed,

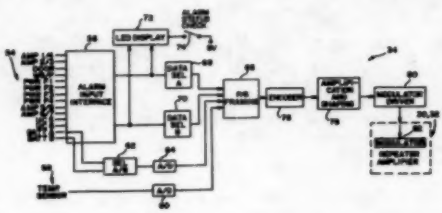
(e) wherein said roller first surface means is characterized as having a diameter dimension and said roller second surface means is angularly disposed relative to said roller first surface means and said roller second surface means is characterized as having a length dimension of relative size to said diameter dimension when measured on an axis generally transverse to said roller first surface means, said roller first surface means being further characterized as being operatively associated only with said first rail track surface means and with said first car surface means, said roller second surface means being further characterized as being operatively engagable only with said second rail track surface means and said second car surface means.

4,941,198

COMMUNICATIONS REPEATER MONITORING SYSTEM

Edward R. Johnson; Ladan A. Parandoosh, both of Sunnyvale, and Joseph F. Lutz, San Jose, all of Calif., assignors to Peninsula Engineering Group, Inc., San Carlos, Calif.

Filed Nov. 12, 1987, Ser. No. 120,529
Int. Cl.[5] H04B 1/60, 17/02
U.S. Cl. 455—9 **11 Claims**



1. In a communication system having a repeater unit for receiving and retransmitting a communication signal having a predetermined carrier frequency, a monitoring system for monitoring a desired characteristic at the repeater unit comprising:

means for generating a signal representative of the desired characteristic;

means responsive to the generated signal for producing a monitor modulating signal representative of the generated signal and having a frequency substantially not equal to the communication signal carrier frequency; and

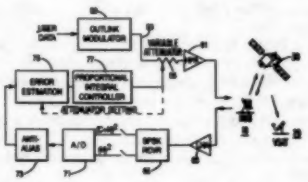
means for modulating the amplitude of the communication signal with the monitor modulating signal, whereby the retransmitted communication signal is representative of the desired characteristic, said modulating means comprising amplifier means having a net gain which varies with the temperature of said amplifier means, for amplifying the communication signal, means for varying the net gain of said amplifier means in response to said monitor modulating signal, means for varying the net gain of said amplifier means in a manner compensating for the change in net gain due to temperature change, and means for varying the level of the monitor modulating signal in response to temperature changes in said amplifier means for maintaining the ratio of the signal level of the monitor modulating signal to the signal level of the communication signal substantially at a predetermined value.

4,941,199

UPLINK POWER CONTROL MECHANISM FOR MAINTAINING CONSTANT OUTPUT POWER FROM SATELLITE TRANSPONDER

Thomas J. Saam, Melbourne, Fla., assignor to Scientific Atlanta, Atlanta, Ga.

Filed Apr. 6, 1989, Ser. No. 334,146
Int. Cl.[5] H04B 1/60
U.S. Cl. 455—10 **20 Claims**



1. For use in a satellite communications network wherein

signals transmitted over an uplink communications channel from a transmitting terminal to a satellite amplifier device are amplified by said satellite amplifier device and conveyed therefrom over an outlink channel to a receiver terminal, a method of controlling the output of said transmitting terminal so as to maintain the strength of signals output by said satellite amplifier device effectively constant irrespective of variations in atmospheric conditions in the uplink signal transmission path between the transmitting terminal and the satellite comprising the steps of:

(a) transmitting first signals over said uplink communications channel to said satellite to be amplified by said satellite amplifier device and conveyed therefrom over said outlink channel to said receiver terminal and over a downlink channel to a receiver device located at said transmitter terminal, and generating second signals representative of the strength of the transmitted first signals;

(b) monitoring, at said transmitter terminal, first signals that have been amplified by said satellite amplifier device and conveyed therefrom over said downlink channel, and producing therefrom third signals representative of the signal-to-noise ratio in the monitored signals;

(c) in response to said second and third signals, generating fourth signals representative of the attenuation of said first signals resulting from variations in conditions in the uplink signal transmission path to said satellite; and

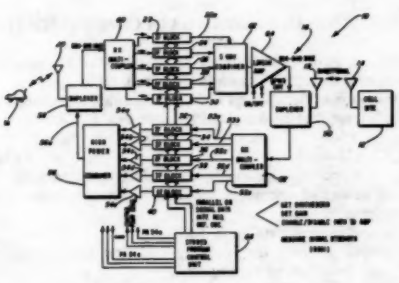
(d) adjusting the strength of said first signals as transmitted by said transmitter terminal in accordance with said fourth signals, so as to compensate for the attenuation thereof resulting from conditions in said uplink signal transmission path and thereby maintain the strength of signals output by said satellite amplifier device effectively constant.

4,941,200

BOOSTER

Samuel A. Leslie, Forest, and Robert T. Gordon, Lynchburg, both of Va., assignors to Orion Industries, Inc., Solon, Ohio

Filed Aug. 3, 1987, Ser. No. 81,120
Int. Cl.[5] H04B *7/14*; H04Q *7/00*
U.S. Cl. 455—17 **36 Claims**



9. A method of receiving a plurality of electro-magnetic signals and for retransmitting selected ones thereof comprising:

sensing a plurality of electro-magnetic signals;

determining, based on a preset criterion, which of the sensed signals should be compared with a threshold and comparing a first indicium of each of those signals to a predetermined threshold;

recording a second indicium for each sensed signal that exceeds the threshold;

selecting one or more signals to be retransmitted among the recorded second indicia; and

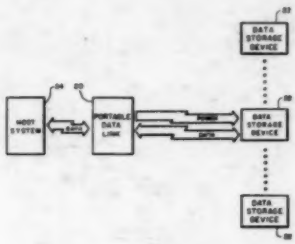
retransmitting only the selected one or more signals.

4,941,201

ELECTRONIC DATA STORAGE AND RETRIEVAL APPARATUS AND METHOD

Charles L. Davis, Flower Mound, Tex., assignor to Abbott Laboratories, Abbott Park, Ill.

Continuation of Ser. No. 818,469, Jan. 13, 1985, abandoned. This application Apr. 4, 1989, Ser. No. 333,859
Int. Cl.[5] H04B *5/00*
U.S. Cl. 455—41 **45 Claims**



18. An electronic data apparatus comprising:

means for receiving a combination signal having power and data components;

means for deriving operating power and first data signals from said combination signal; and

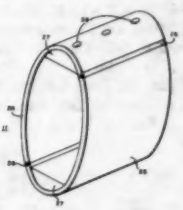
means for modulating said combination signal with a value corresponding to second data signals in said apparatus to transmit said second data signals while simultaneously continuing to receive said combination signal.

4,941,202

MULTIPLE SEGMENT FLEXTENSIONAL TRANSDUCER SHELL

Ralph G. Upton, Nashua, N.H., assignor to Sanders Associates, Inc., Nashua, N.H.

Filed Sep. 13, 1982, Ser. No. 416,793
Int. Cl.[5] H04R *17/00*
U.S. Cl. 367—165 **49 Claims**



1. A flextensional transducer having a hollow shell with two open ends that are covered with a material and at least one driving element interposed between the inner walls of said shell, said transducer shell comprises:

(a) a first J-shaped metal member;

(b) a second J-shaped metal member, said first and second members are welded together, to form said smooth hollow shell, at or near two nodal points on the surface of said shell; and

(c) a boot that is placed over said members and said material so that the interior of said shell will be watertight.

4,941,203

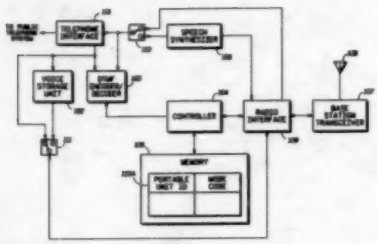
TWO-WAY RADIO COMMUNICATION SYSTEM HAVING SELECTABLE OPERATING MODES

Stelios J. Patsiokas, Plantation; Morris A. Moore, West Palm Beach, and Brian K. A. Johnson, Coral Springs, all of Fla., assignors to Motorola, Inc., Schaumburg, Ill.

Continuation of Ser. No. 242,838, Sep. 12, 1988, abandoned. This application Nov. 13, 1989, Ser. No. 434,633

Int. Cl.[5] H04B *1/00*

U.S. Cl. 455—53 23 Claims



10. A radio base station, for use with a remote radio transceiver unit that includes means for transmitting a code indicative of a selected operating mode, said base station comprising in combination:

base station transceiver means for transmitting radio signals to and receiving radio signals from said remote unit;

code storing means for storing the code transmitted by said remote unit and received by said base station transceiver means;

message for communicating with a call originator;

message storage means, coupled to said communication means, for storing a message form said call originator when the code stored in said code storing means is indicative of a message storage mode; and

communication means, coupled to said communicating means and said base station transceiver means, for establishing communications between said call originator and said remote unit when the code stored in said code storing means is indicative of a communication mode.

4,941,204

GENERATING A STOP SIGNAL OF AN AUTOMATIC SEARCH PROCEDURE FOR A BROADCASTING STATION USING AN AVAILABLE AFC SIGNAL

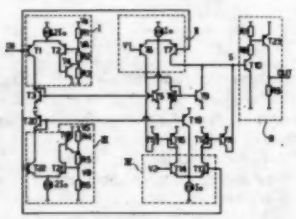
Maurizio Zuffada, Milan, and Fabrizio Sacchi, Gambarana, both of Italy, assignors to SGS-Thomson Microelectronics s.r.l., Italy

Filed Jan. 27, 1989, Ser. No. 302,280

Claims priority, application Italy, Jan. 28, 1988, 83601 A/88

Int. Cl.[5] H04B *1/26*

U.S. Cl. 455—164 3 Claims



1. A circuit for detecting in an AFC signal, generated by an automatic frequency control circuit of a receiver during a search scan for a broadcasting station, the presence of a carrier comprising:

a first switched threshold comparator with two threshold levels VA', VA", commuting when said AFC signal which is applied to an input terminal of the first comparator rises to a level higher than the two threshold levels of said first switched threshold comparator wherein commuting of the first comparator is in accordance with the following relation:

$$VA' < AFC > VA'';$$

a second comparator having a fixed threshold level v1 and which is enabled when said first comparator commutes in accordance with said relation, commuting when said AFC signal which is applied to an input terminal of said second comparator drops to a level lower than said threshold V1;

a third switched threshold comparator with two threshold levels VB', VB", which commutes when said AFC signal which is applied to an input terminal thereof drops to a level lower than the two threshold levels of said third switched threshold comparator wherein the third comparator commutes in accordance with the following second relation:

$$VB' > AFC < VB_2'';$$

a fourth comparator having a fixed threshold level V2 and which is enabled when said third comparator commutes in accordance with said second relation, commuting when said AFC signal which is applied to an input terminal thereof rises to a level higher than said threshold V2;

an output buffer, driven by said second or by said fourth comparator, and capable of generating an output signal when any of said second and fourth comparators commutes, thus detecting the presence of the carrier;

and wherein:

the relationships among said threshold levels of said comparators are as follows:

$$VA' > V1 > Va'' > V/x > VB'' > V2 > VB,$$

where V /x is a fraction of the supply voltage powering the circuit and corresponds to the AFC signal level when the receiver is out of tune.

4,941,205

BIDIRECTIONAL OPTICAL DATA COMMUNICATIONS SYSTEM

William R. Horst, and William J. Hale, both of Dayton, Ohio, assignors to NCR Corporation, Dayton, Ohio

Continuation of Ser. No. 618,001, Jul. 6, 1984, abandoned. This application Jul. 11, 1988, Ser. No. 217,509

Int. Cl.[5] H04B *10/10*

U.S. Cl. 455—605 4 Claims

1. A data communications system which operates in first and second modes of operation; said data communications system comprising:

first and second data units; and

a coupling means for coupling said first and second data units less than an inch apart;

said first data unit being a host terminal comprising:

a first data means for handling data;

first and second light sources;

a first modulating means for modulating said first light source in accordance with a first stream of data supplied by said first data means to generate a first beam of modulated light when said system is operated in said first mode of operation; and

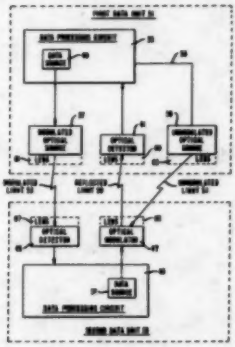
a first optical detector for detecting a second beam of modulated light and also for generating a second stream of data by demodulating said second beam of modulated light when said system is operated in said second mode of operation; said second stream of data being passed on to said first data means from said first optical detector;

said second data unit being a portable terminal positioned in face to face relation with said host terminal comprising:

a second data means for handling data;

a second modulating means including a liquid crystal device for modulating the light of said second light source in accordance with a third stream of data supplied by said second data means to generate said second beam of modulated light to be detected by said first optical detector when said system is operated in said second mode of operation; and

a second optical detector for detecting said first beam of



modulated light and also for generating a fourth stream of data by demodulating said first beam of modulated light when said system is operated in said first mode of operation; said fourth stream of data being passed on to said second data means from said second optical detector; and

said coupling means having means for positioning said first light source and said first modulating means in face to face opposed relation with said second optical detector, said second light source in substantially face to face opposed relation with said second modulating means, and said second modulating means being in opposed relation with said first optical detector.

4,941,206

LOOP-TYPE OPTICAL FIBER TRANSMISSION SYSTEM HAVING MASTER AND SLAVE APPARATUS

Tsutomu Sakurai, Ikoma; Yoshifumi Hara, Hirakata, and Yasumasa Dougakiuchi, Kadoma, all of Japan, assignors to Matsushita Electric Industrial Co., Ltd., Kadoma, Japan

Filed Nov. 28, 1988, Ser. No. 276,514

Claims priority, application Japan, Nov. 27, 1987, 62-300766

Int. Cl.[5] H04B 9/00

U.S. Cl. 455—607 **16 Claims**

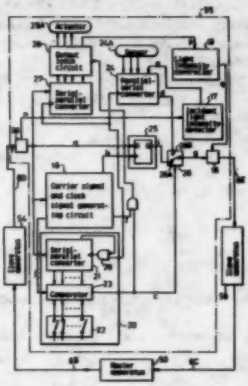
13. A loop-type optical fiber transmission system comprising a master apparatus and a plurality of slave apparatus connected in series by optical fibers, each slave apparatus comprising:

means for receiving a first light signal and converting the first light signal to an electric signal;

means for determining whether the electric signal specifies said slave apparatus;

means for detecting an intensity of the first light signal and outputting a malfunction signal;

means for selecting one of the electric signal and the electric signal including the malfunction signal;



means for converting a selected signal from said selecting means to a second light signal and transmitting the second light signal; and

means for adjusting an intensity of the second light signal.

4,941,207

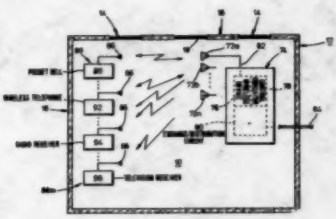
STRUCTURE FOR WIRELESS COMMUNICATION IN AN ELECTROMAGNETICALLY SHIELDED BUILDING

Takamasa Maeda, and Hisashi Ishikawa, both of Mitaka, Japan, assignors to Nihon Musen Kabushiki Kaisha, Mitaka, Japan

Continuation-in-part of Ser. No. 605,924, May 1, 1984, abandoned. This application Mar. 6, 1987, Ser. No. 22,646

Int. Cl.[5] H04B 9/00

U.S. Cl. 455—617 **15 Claims**



1. A structure for wireless communication in an electromagnetically shielded building, comprising an outer wall made of an electromagnetic shielding material, a ceiling member incorporating an antenna, and a window comprised of a glass pane including an electromagnetic shielding member, wherein said outer wall and said window jointly define an electromagnetically shielded space, said outer wall comprising an electrically conductive material and being connected to ground, said outer wall and said window being electrically connected to each other, wireless transmission/reception means disposed in said electromagnetically shielded space, and said electromagnetically shielded space including therein an electromagnetically shielded subspace on each floor or each room on a floor of the building, the arrangement being such that wireless communication can be effected with radio waves in a selected frequency range within said space between the wireless transmission/-reception means and said antenna.

4,941,208

HIGH PERFORMANCE SUBCARRIER MULTIPLEXED OPTICAL COMMUNICATION SYSTEM WITH MODULATION INDEX EXCEEDING UNITY

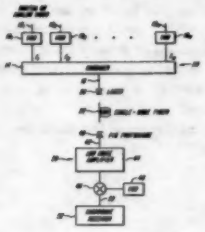
Robert Olshansky, Wayland, and Vincent Lanzisera, Northboro, both of Mass., assignors to GTE Laboratories Incorporated, Waltham, Mass.

Filed Sep. 8, 1988, Ser. No. 241,975
Int. Cl.[5] H04B 9/00
U.S. Cl. 455—618 15 Claims

1. Apparatus for transmitting an optical signal, comprising:

means for generating a light beam; and

means for intensity modulating the light beam with a composite modulation signal comprising a plurality of modulated microwave carriers, each of said microwave carriers intensity modulating said light beam with a modulation index m_i to provide an optical signal for transmission, wherein the total modulation index M, defined by



$$M = \Sigma m_i$$

of the optical signal is greater than one.

DESIGN PATENTS

GRANTED JUL. 10, 1990

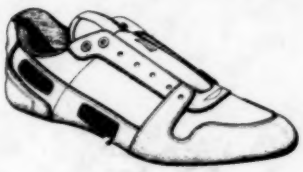
ERRATA

For CLASS	See PATENT NO.
D09-375	309,080

DESIGNS

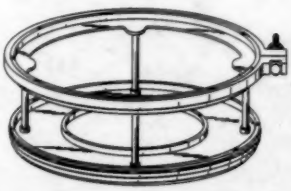
JULY 10, 1990

309,055
SPORT SHOE UPPER
Ian H. Whatley, Nashville, Tenn., assignor to Genesco Inc., Nashville, Tenn.
Filed Feb. 11, 1988, Ser. No. 155,020
Term of patent 14 years
U.S. Cl. D2—314

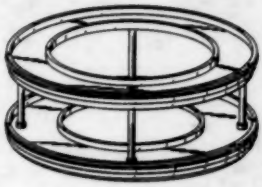


309,056
EMBROIDERY WORK STATION
Gerald A. Peters, Box 1020, Carnegie, Okla. 73015
Filed Mar. 18, 1987, Ser. No. 27,494
Term of patent 14 years
U.S. Cl. D3—25

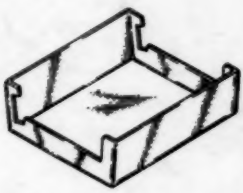
309,057
EMBROIDERY WORK STATION
Gerald A. Peters, Box 1020, Carnegie, Okla. 73015
Filed Mar. 18, 1987, Ser. No. 27,497
Term of patent 14 years
U.S. Cl. D3—26



309,058
EMBROIDERY WORK STATION
Gerald A. Peters, Box 1020, Carnegie, Okla. 73015
Filed Mar. 18, 1987, Ser. No. 27,495
Term of patent 14 years
U.S. Cl. D3—26



309,059
AUTOMOBILE SEAT TRAY
M. Michael Bledsoe, 6013 Dusty Rd., Watauga, Tex. 76148-3650
Filed Feb. 26, 1987, Ser. No. 19,291
Term of patent 14 years
U.S. Cl. D3—40



309,060
KEY RETAINER
Charles A. Parachinni, 708 Clearview La., Atlantic Beach, Fla. 32233
Filed Nov. 23, 1987, Ser. No. 124,755
Term of patent 14 years
U.S. Cl. D3—61

309,061
FASHION POCKET INSERT
Jeri D. Lesch, 3013 Owen Ave., Marina, Calif. 93933
Filed Aug. 19, 1986, Ser. No. 898,266
Term of patent 14 years
U.S. Cl. D3—106

309,062
BRUSH HEAD FOR MOUNTING IN A DENTAL INSTRUMENT
Hans Olsen, Copenhagen, Denmark, assignor to Professional Dental Technologies, Inc., Batesville, Ark.
Continuation of Ser. No. No. 654,189, Sep. 24, 1984. This application May 10, 1988, Ser. No. 192,495
Claims priority, application Denmark, Mar. 29, 1984, 296/84
The portion of the term of this patent subsequent to Feb. 27, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D4—104

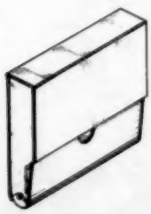
309,063
BENCH
Peter M. Y. Kee, Happy Valley, Hong Kong, assignor to Rosalco, Inc., Louisville, Ky.
Filed Jan. 10, 1989, Ser. No. 295,474
Term of patent 14 years
U.S. Cl. D6—349

309,064
ARM CHAIR
Manfeld Hubert, La Tronche, France, assignor to Allibert S.A., Grenoble, France
Filed Feb. 6, 1987, Ser. No. 12,065
Term of patent 14 years
U.S. Cl. D6—375

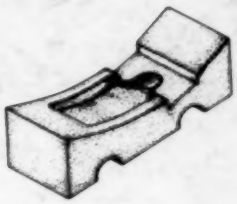
309,065
ADJUSTABLE TABLE FOR ATTACHMENT TO AN AUTOMOBILE TAILGATE
Atwood J. Huff, 3425 Frontier Rd., NW., Roanoke, Va. 24012
Filed Jun. 3, 1987, Ser. No. 56,979
Term of patent 14 years
U.S. Cl. D6—429

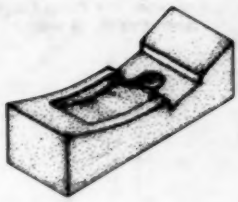
309,066
MAGAZINE HOLDER
Kenneth C. Foran, Wooster, and Thomas J. David, Worthington, both of Ohio, assignors to Rubbermaid Incorporated, Wooster, Ohio
Filed Aug. 7, 1986, Ser. No. 894,243
Term of patent 14 years
U.S. Cl. D6—466

309,067
AUTOMATIC TAMPON DISPENSER
Frank Arrias, 5698 Starwood Ct., Westlake Village, Calif. 91362
Filed Jan. 19, 1988, Ser. No. 145,255
Term of patent 14 years
U.S. Cl. D6—515

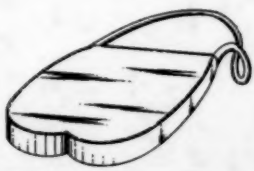


309,068
BABY SUPPORT PILLOW
Cindy Jordan, and Alan Jordan, both of 19760 NE. 10th Ave., North Miami Beach, Fla. 33179
Filed Jul. 1, 1987, Ser. No. 68,314
Term of patent 14 years
U.S. Cl. D6—601

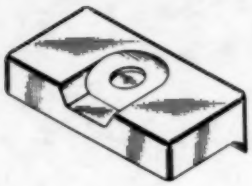




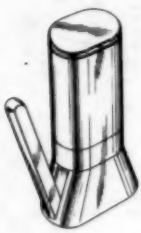
309,069
STADIUM CUSHION OR THE LIKE
Brenda K. DeRosa, 12444 Victory Blvd. #104, Los Angeles, Calif. 91606
Filed Nov. 9, 1987, Ser. No. 118,636
Term of patent 14 years
U.S. Cl. D6—601



309,070
INFLATABLE ORTHOPEDIC PILLOW
William H. Burns, Sr., 3715 Bryce St., Cocoa, Fla. 32326
Filed Jan. 30, 1987, Ser. No. 9,130
Term of patent 14 years
U.S. Cl. D6—604

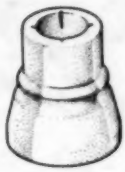


309,071
CONDIMENT DISPENSER
Peter Haythornthwaite, Auckland, New Zealand, assignor to Frederick Daniel van Urk and Fredrikus Hermannus van Urk, both of Auckland, New Zealand
Filed Oct. 8, 1986, Ser. No. 916,849
Claims priority, application New Zealand, Apr. 8, 1986, 20409
Term of patent 14 years
U.S. Cl. D7—600

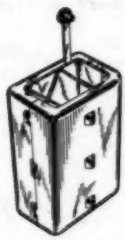


309,072
BEVERAGE CONTAINER HOLDER
Homayun Golkar, 9041 Pacific, #4, Anaheim, Calif. 92804
Filed Mar. 25, 1988, Ser. No. 172,863
Term of patent 14 years
U.S. Cl. D7—622

309,073
DRINKING CAN HOLDER
Lloyd A. Robinson, 14799 Caminito Orense E., San Diego, Calif. 92129
Filed Jun. 30, 1988, Ser. No. 214,136
Term of patent 14 years
U.S. Cl. D7—608



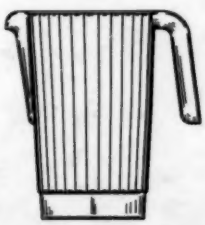
309,074
SQUEEZE RESISTANT CARTON HOLDER
Henry J. Kelston, 23 Clinton Ave., Nyack, N.Y. 10960
Filed Mar. 2, 1988, Ser. No. 163,046
Term of patent 14 years
U.S. Cl. D7—602



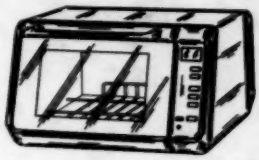
309,075
TOOTHPICK CASE
Ambrogio Rossari, Milan, Italy, assignor to Fratelli Guzzini S.p.A., Recanati, Italy
Filed Oct. 16, 1987, Ser. No. 109,250
Claims priority, application Italy, Apr. 27, 1987, 21464/87[U]
Term of patent 14 years
U.S. Cl. D7—641

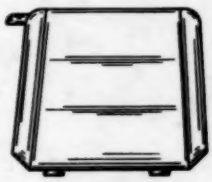
309,076
THERMAL BEVERAGE SERVER
Ulf Hanses, Borlange, Sweden, assignor to Boda Nova International AB, Stockholm, Sweden
Filed Apr. 9, 1987, Ser. No. 36,525
Claims priority, application Sweden, Oct. 10, 1986, 86-2347
Term of patent 14 years
U.S. Cl. D7—316

309,077
PITCHER
James F. Pomroy, St. Paul, Minn., assignor to Plastics, Inc., St. Paul, Minn.
Filed Jun. 8, 1987, Ser. No. 59,396
Term of patent 14 years
U.S. Cl. D7—318

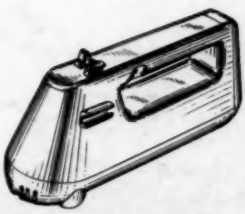


309,078
MICROWAVE OVEN
Mami Kokubo, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Dec. 9, 1987, Ser. No. 130,731
Claims priority, application Japan, Jun. 12, 1987, 62-24267[U]
The portion of the term of this patent subsequent to Apr. 18, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D7—351





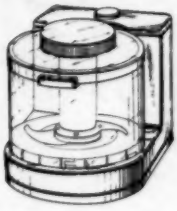
309,079
HAND MIXER
Aidan Petrie, and Stephen Lane, both of Boston, Mass., assignors to International Consumer Brands, Inc., Trumbull, Conn.
Filed Feb. 10, 1988, Ser. No. 154,407
Term of patent 14 years
U.S. Cl. D7—379



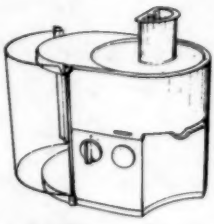
309,080
BOTTLE OR THE LIKE
John F. Buchholz, Boston, Mass., assignor to Ciba Corning Diagnostics Corp., Medfield, Mass.
Filed Aug. 28, 1987, Ser. No. 90,040
Term of patent 14 years
U.S. Cl. D9—375

309,081
PORTABLE ELECTRIC FOOD MIXER
Richard K. Thomas, Elk Grove Village, Ill., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Jan. 15, 1988, Ser. No. 144,450
Term of patent 14 years
U.S. Cl. D7—379

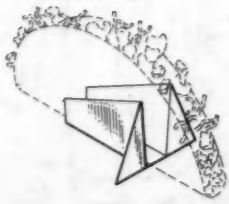
309,082
FOOD PROCESSOR
Sally A. Hattle, Oxford, and Paul Rawson, Easton, both of Conn., assignors to Black & Decker Inc., Newark, Del.
Filed Jun. 30, 1987, Ser. No. 67,781
Term of patent 14 years
U.S. Cl. D7—384



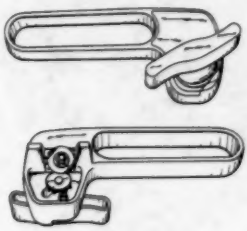
309,083
JUICE EXTRACTOR
Hartwig Kahlcke, Kronberg, Fed. Rep. of Germany, assignor to Braun Aktiengesellschaft, Kronberg, Fed. Rep. of Germany
Filed Feb. 18, 1987, Ser. No. 16,146
Claims priority, application Fed. Rep. of Germany, Sep. 6, 1986, 73 MR 9512
Term of patent 14 years
U.S. Cl. D7—665



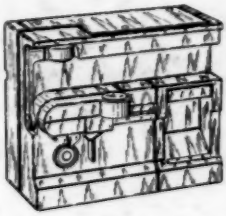
309,084
TACO SHELL HOLDER
Richard E. Alsup, 761 N. Virgil Ave., Los Angeles, Calif. 90029
Filed May 9, 1988, Ser. No. 191,497
Term of patent 14 years
U.S. Cl. D7—504



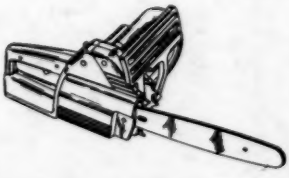
309,085
CAN OPENER
Georg H. Usbeck, Frauenbergstrasse 33, D-3550 Marburg/Lahn 1, Fed. Rep. of Germany
Filed Aug. 12, 1987, Ser. No. 84,113
Claims priority, application Fed. Rep. of Germany, Feb. 19, 1987, 16 MR 348
Term of patent 14 years
U.S. Cl. D8—33



309,086
CAN-OPENER
Jan F. Van Asten, Klagenfurt, Austria, assignor to U.S. Philips Corporation, New York, N.Y.
Filed May 17, 1988, Ser. No. 194,782
Claims priority, application United Kingdom, Nov. 23, 1987, 1,046,548
Term of patent 14 years
U.S. Cl. D8—36



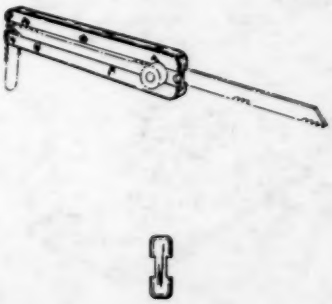
309,087
ELECTRIC CHAIN SAW
Etsushi Yamamoto, Hiroshima, and Toshiaki Saito, Tokyo, both of Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Oct. 2, 1987, Ser. No. 103,974
Claims priority, application Japan, Apr. 17, 1987, 62-15226
Term of patent 14 years
U.S. Cl. D8—65



309,088
PORTABLE AIR NAILER
Yasunori Ogawa, and Kunio Yamamoto, both of Ibaragi, Japan, assignors to Hitachi Koki Co., Ltd., Tokyo, Japan
Filed May 27, 1987, Ser. No. 54,901
Term of patent 14 years
U.S. Cl. D8—68

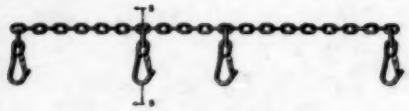
309,089
SCREWDRIVER
Shintaro Tsuji, Tokyo, Japan, assignor to Sanrio Company, Ltd., Tokyo, Japan
Filed Jul. 7, 1987, Ser. No. 70,515
Term of patent 14 years
U.S. Cl. D8—82

309,090
HANDLE FOR POCKET BLADE
John M. Schmidt, 19653 Landcaster, Harper Woods, Mich. 48225, and Richard J. Osemlak, 16236 State Fair, Detroit, Mich. 48205
Filed Jul. 6, 1987, Ser. No. 70,502
Term of patent 14 years
U.S. Cl. D8—99



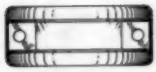
309,091
TOILET SEAT HANDLE
Lester Shepard, 1321 E. 52nd St., Chicago, Ill. 60615
Filed Dec. 21, 1987, Ser. No. 135,632
Term of patent 14 years
U.S. Cl. D8—305

309,092
CARGO BOX DOOR SAFETY CHAIN
Howard C. Dege, and Paul R. Gilmore, both of Seaford, Del., assignors to E. I. Du Pont de Nemours and Company, Wilmington, Del.
Filed May 13, 1988, Ser. No. 193,866
Term of patent 14 years
U.S. Cl. D8—331



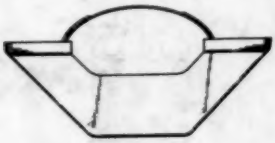
309,093
COMBINED WALL PLATE AND ELECTRICAL PLUG SAFETY CAP
Eric K. Reinholt, 511 Tish Cir., #1908, Arlington, Tex. 76006
Filed Oct. 22, 1987, Ser. No. 111,566
Term of patent 14 years
U.S. Cl. D8—353

309,094
SHAFT ALIGNMENT COLLAR
Raymond N. Donis, Souderton, and Stephen B. Wilcher, Harleysville, both of Pa., assignors to FMC Corporation, Chicago, Ill.
Filed Mar. 7, 1988, Ser. No. 165,206
Term of patent 14 years
U.S. Cl. D8—354



309,095
GROUND ANCHOR FOR A SOAKER HOSE
Edwin S. Holley, Waldport, Oreg., assignor to Code 10 Corporation, Jacksonville, Oreg.
Continuation of Ser. No. 863,784, May 16, 1986, abandoned.
This application Aug. 31, 1987, Ser. No. 91,314
Term of patent 14 years
U.S. Cl. D8—356

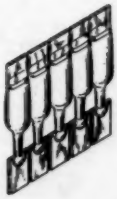
309,096
COMBINED AUTOMOTIVE PARTS AND FLUID CONTAINER
Jerry L. Dodge, Eugene, Oreg., assignor to Dodge & Associates, Ltd., Eugene, Oreg.
Filed Nov. 24, 1986, Ser. No. 934,357
Term of patent 14 years
U.S. Cl. D9—337



309,098
BOTTLE OR SIMILAR ARTICLE
Michel A. Moret, Geneva, Switzerland, assignor to Les Produits Associes LPA-Breze S.A., Switzerland
Filed Dec. 3, 1986, Ser. No. 937,665
Term of patent 14 years
U.S. Cl. D9—371

309,099
FLEXIBLE CONTAINER
Michel Cazes, Vittel, France, assignor to Societe Generale des Eaux Minerales de Vittel, Vittel, France
Filed Nov. 12, 1986, Ser. No. 930,371
Claims priority, application France, May 15, 1986, 143
Term of patent 14 years
U.S. Cl. D9—373

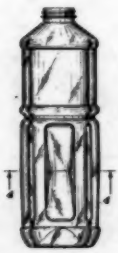
309,097
PACKAGE OF CONTAINERS
Philip T. Price, Isleworth, England, assignor to Glaxo Group Limited, London, United Kingdom
Filed Sep. 4, 1987, Ser. No. 92,932
Claims priority, application United Kingdom, Mar. 5, 1987, 1040494
Term of patent 14 years
U.S. Cl. D9—341



309,100
CONTAINER BODY FOR LIQUIDS AND THE LIKE
Ted L. Beaver, Roselle, Ill., assignor to Quaker State Corporation, Stamford, Conn.
Filed Jan. 9, 1986, Ser. No. 817,484
The portion of the term of this patent subsequent to Sep. 26, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—375

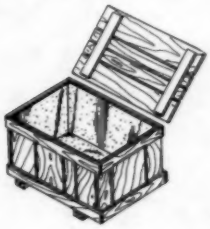
309,101
DECANTER
Colette M. Gardere, Pauillac, France, assignor to Societe Civile due Vignoble de Chateau Latour, France
Filed Oct. 27, 1986, Ser. No. 923,701
Claims priority, application France, Jul. 8, 1986, 86 3659
Term of patent 14 years
U.S. Cl. D9—385

309,102
BOTTLE
Hans-Peter Wild, Heidelberg, Fed. Rep. of Germany, assignor to Rudolf Wild GmbH & Co. International KG, Fed. Rep. of Germany
Filed Sep. 1, 1988, Ser. No. 239,413
Term of patent 14 years
U.S. Cl. D9—401



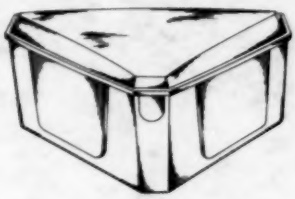
309,103
BOTTLE
William S. Maginnis, Jr., Fullerton, Calif., assignor to Beatrice/Hunt-Wesson, Inc., Fullerton, Calif.
Filed Jun. 15, 1987, Ser. No. 62,825
Term of patent 14 years
U.S. Cl. D9—404

309,104
WOOD CRATE
Roger Solomon, Watchung, N.J., assignor to Test-Rite Products Corp., Clifton, N.J.
Filed Jul. 1, 1987, Ser. No. 68,319
Term of patent 14 years
U.S. Cl. D9—420



309,105
SANDWICH PACKAGE
Robert E. C. Fisher, 6989 Celtic Ct., Dublin, Ohio 43017; Joseph A. Pantelleria, 8028 Saddle Run, Powell, Ohio 43065, and Timothy K. Sheehan, 2215 Folsom St., Eau Claire, Wis. 54703
Filed Mar. 26, 1987, Ser. No. 30,545
Term of patent 14 years
U.S. Cl. D9—425

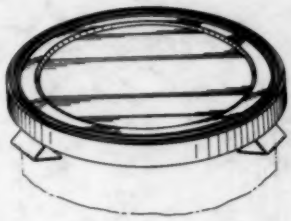
309,106
DOCK STORAGE BOX
Richard L. Willson, South Bend, Ind., assignor to Spin-Cast Plastics, Inc., S. Bend, Ind.
Filed Mar. 28, 1988, Ser. No. 174,538
Term of patent 14 years
U.S. Cl. D9—430



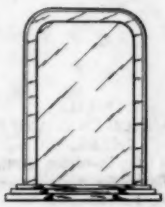
309,107
BLANK FOR PACKAGE OR THE LIKE
Stig Winterling, Yrsnögränd 4, S-126 57 Hägersten, Sweden
Filed Dec. 3, 1986, Ser. No. 937,513
Claims priority, application Sweden, Jun. 6, 1986, 86-1386
The portion of the term of this patent subsequent to Jun. 5, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D9—433

309,108
LIQUID APPLICATOR
Salvatore Tomasello, 9021 Melrose Ave., Los Angeles, Calif. 90069
Filed Aug. 27, 1987, Ser. No. 90,201
Term of patent 14 years
U.S. Cl. D9—434

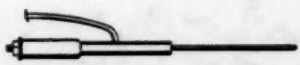
309,109
COMBINED LID AND SEAL FOR CONTAINERS
David O. Allen, Wilmington, Ohio, assignor to Allen Tool Company, Inc., Wilmington, Ohio
Filed Nov. 3, 1986, Ser. No. 926,783
Term of patent 14 years
U.S. Cl. D9—436



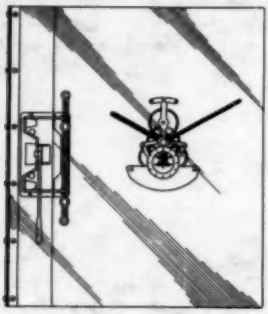
309,110
ANNIVERSARY CLOCK CASE
Günter Neininger, Villingen-Schwenningen, Fed. Rep. of Germany, assignor to Kieninger & Obergfell GmbH & Co., St. Georgen, Fed. Rep. of Germany
Filed Oct. 29, 1986, Ser. No. 925,140
Claims priority, application Fed. Rep. of Germany, Apr. 30, 1986, MR 1282
Term of patent 14 years
U.S. Cl. D10—1



309,111
ALARM SENSOR FOR THE UNDERCARRIAGE OF AUTOMOBILES
David E. Joseffy, 1326 S. Carson Way, Aurora, Colo. 80012
Filed Oct. 5, 1987, Ser. No. 104,662
Term of patent 14 years
U.S. Cl. D10—117



309,112
CLOCK
Rolf Ziegler, Walchwil, Switzerland, assignor to Bluwat AG, Zug, Switzerland
Filed Dec. 15, 1986, Ser. No. 942,006
Claims priority, application Hague, Jun. 24, 1986, DMA/000512
Term of patent 14 years
U.S. Cl. D10—6



309,113
COMBINED WATCH CASE AND WRISTBAND THEREFOR
Eddy Schoepfer, La Chaux-du-Milieu, Switzerland, assignor to Tag-Heuer S.A., Bienne, Switzerland
Filed Oct. 10, 1986, Ser. No. 918,093
Claims priority, application World Int. Prop. O., Apr. 15, 1986, DMA/000489
Term of patent 14 years
U.S. Cl. D10—32

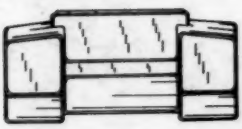
309,114
WRISTWATCH
Emile M. F. Benoit-Pequignet, Fournets-Luisans, and Jean-Pierre L. Viennet, Morteau, both of France, assignors to Montres Emile Pequignet, Morteau, France
Filed Nov. 25, 1986, Ser. No. 936,651
Claims priority, application France, May 30, 1986, 863-345
Term of patent 14 years
U.S. Cl. D10—33

309,115
HUMIDITY SENSOR
Robert E. Yockey, Barling, and John F. Yockey, Russellville, both of Ark., assignors to Bay Ridge Distributing, Inc., Russellville, Ark.
Filed Oct. 28, 1986, Ser. No. 924,586
Term of patent 14 years
U.S. Cl. D10—56

309,116
COMBINED COLLAPSIBLE CUP, COMPASS AND ALTIMETER
Ernest H. Marshall, 30 Saulters Rd., Manchester, Conn. 06040
Filed Oct. 30, 1987, Ser. No. 114,374
Term of patent 14 years
U.S. Cl. D10—62

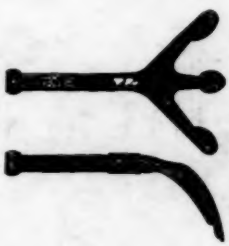
309,117
SCALE BASE
Francesco L. Carnevale, Waynesboro, Miss., assignor to Sunbeam Corporation, Downers Grove, Ill.
Filed Nov. 14, 1986, Ser. No. 931,455
Term of patent 14 years
U.S. Cl. D10—94

309,118
FLOW METER
Robert E. Hall, Wichita, Kans., assignor to Great Plains Industries, Inc., Wichita, Kans.
Filed Apr. 27, 1987, Ser. No. 43,235
Term of patent 14 years
U.S. Cl. D10—96



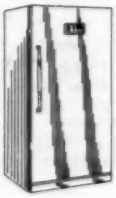
309,119
RECEIVER FOR TRACKING DEER HUNTING ARROWS
Mark L. Kremitzki, 206 S. State, Springfield, Ill. 62704
Filed Sep. 24, 1987, Ser. No. 100,707
Term of patent 14 years
U.S. Cl. D10—104

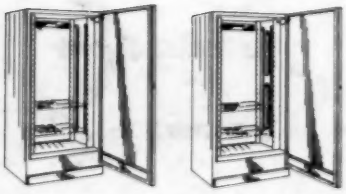
309,120
SOUND-PRODUCING RATTLING ANTLER FOR ATTRACTING DEER AND ELK
Johnny E. Stewart, Waco, Tex., assignor to Johnny Stewart Game Calls, Inc., Waco, Tex.
Filed Apr. 2, 1987, Ser. No. 33,548
Term of patent 14 years
U.S. Cl. D10—116



309,121
SOUND-PRODUCING RATTLING ANTLER FOR ATTRACTING DEER AND ELK
Johnny E. Stewart, Waco, Tex., assignor to Johnny Stewart Game Calls, Inc., Waco, Tex.
Filed Apr. 2, 1987, Ser. No. 33,546
Term of patent 14 years
U.S. Cl. D10—116

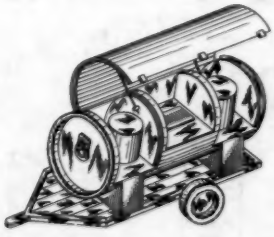
309,122
ENVIRONMENTAL CHAMBER FOR CONTROLLED PLANT GROWTH
Harry P. Biemolt, Ambler, Pa., assignor to Hotpack Corporation, Philadelphia, Pa.
Filed Dec. 21, 1987, Ser. No. 135,634
Term of patent 14 years
U.S. Cl. D11—145



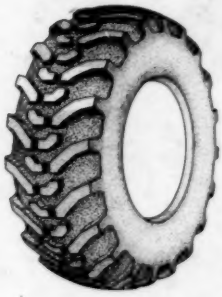


309,123
SNOW SLED
Richard E. Brooks, 822 W. Hyde Park, St. Joseph, Mo. 64504
Filed Nov. 6, 1987, Ser. No. 117,320
Term of patent 14 years
U.S. Cl. D12—11

309,124
BEVERAGE DISPENSING TRAILER
David R. Young, 8704 Easy St., Massillon, Ohio 44646
Filed Feb. 25, 1987, Ser. No. 18,988
Term of patent 14 years
U.S. Cl. D12—102



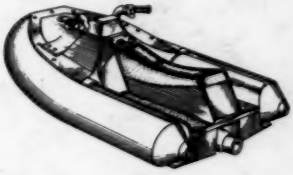
309,125
TIRE
Mark L. Bonko, Hartville, and Loran C. Lopp, Jr., Wadsworth, both of Ohio, assignors to The Goodyear Tire & Rubber Company, Akron, Ohio
Filed Jan. 30, 1987, Ser. No. 9,395
The portion of the term of this patent subsequent to Oct. 31, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D12—151



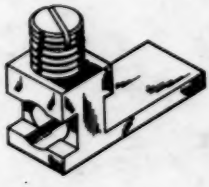
309,126
BRACKET FOR SUPPORTING MOUNTING BAR ON VEHICLE
Jeff A. Carr, 10433 Samoline Ave., Downey, Calif. 90241
Filed Apr. 20, 1987, Ser. No. 40,143
Term of patent 14 years
U.S. Cl. D12—157

309,127
MOTORCYCLE REAR CARRIER UNIT
Toshiyuki Yamada, Saitama; Makoto Kitagawa, Tokyo, and Toshio Kurihara, Saitama, all of Japan, assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Sep. 21, 1987, Ser. No. 99,054
Term of patent 14 years
U.S. Cl. D12—158

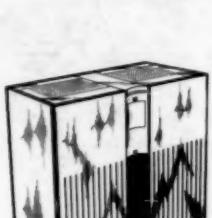
309,128
WATER CRAFT
Lloyd Walker, Newport; Masakazu Matsuzawa, San Pedro, and Martin Manchester, Long Beach, all of Calif., assignors to Honda Giken Kogyo Kabushiki Kaisha, Tokyo, Japan
Filed Nov. 16, 1987, Ser. No. 121,775
Term of patent 14 years
U.S. Cl. D12—316



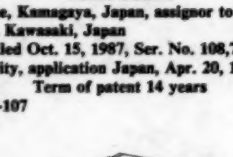
309,129
L-SHAPED ELECTRICAL CONNECTOR
David M. Ottmann, Mississauga, Canada, assignor to Connector Manufacturing Company, Cincinnati, Ohio
Filed Apr. 24, 1986, Ser. No. 857,608
Term of patent 14 years
U.S. Cl. D13—149



309,130
CENTRAL PROCESSOR FOR AN ELECTRONIC COMPUTER
Atsuo Yoshida, Kokubunji; Koushirou Adachi, Tokorozawa; Tousaku Hattori, Tokyo; Hiroshi Watanabe, Hitachi, and Yoshiaki Takahashi, Mito, all of Japan, assignors to Hitachi, Ltd., Tokyo, Japan
Filed Feb. 24, 1988, Ser. No. 160,077
Claims priority, application Japan, Sep. 4, 1987, 62-35952
Term of patent 14 years
U.S. Cl. D14—102



309,131
OPTICAL CHARACTER READER FOR ELECTRONIC COMPUTERS
Hideyuki Horie, Kamagaya, Japan, assignor to Kabushiki Kaisha Toshiba, Kawasaki, Japan
Filed Oct. 15, 1987, Ser. No. 108,724
Claims priority, application Japan, Apr. 20, 1987, 62-15154
Term of patent 14 years
U.S. Cl. D14—107



309,132
MODEM OR SIMILAR ARTICLE
Peter H. Muller, Los Gatos; Peter E. Lowe, Palo Alto, and Peter R. Edwards, San Lorenzo, all of Calif., assignors to Hayes Microcomputer Products, Inc., Norcross, Ga.
Filed Feb. 22, 1988, Ser. No. 159,000
Term of patent 14 years
U.S. Cl. D14—107

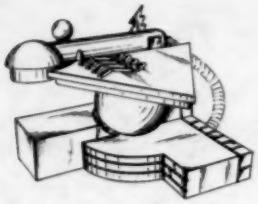
309,133
TELEVISION RECEIVER
Jae S. Jo, Seoul, Rep. of Korea, assignor to Gold Star Co., Ltd., Seoul, Rep. of Korea
Filed Dec. 8, 1988, Ser. No. 281,511
Claims priority, application Rep. of Korea, Jun. 29, 1988, 8981/1988
Term of patent 14 years
U.S. Cl. D14—126

309,134
TELEVISION SET
Shigeru Kurosumi; Yoshito Fujii, and Harumi Sakamoto, all of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 9, 1987, Ser. No. 94,543
Term of patent 14 years
U.S. Cl. D14—126

309,135
COMBINED VIDEO TAPE RECORDER AND TELEVISION RECEIVER
Takeshi Iwama, Tokyo, Japan, assignor to Sony Corporation, Tokyo, Japan
Filed Nov. 10, 1987, Ser. No. 119,412
Claims priority, application Japan, May 22, 1987, 62-20095
Term of patent 14 years
U.S. Cl. D14—129

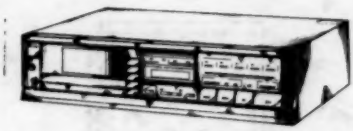
309,136
PORTABLE TWO-WAY RADIO OR SIMILAR ARTICLE
Craig F. Siddoway, Ft. Lauderdale, Fla., assignor to Motorola, Inc., Schaumburg, Ill.
Filed Nov. 2, 1987, Ser. No. 116,742
Term of patent 14 years
U.S. Cl. D14—137

309,137
TELEPHONE SET OR SIMILAR ARTICLE
Marshall Gisser, Far Rockaway, N.Y., assignor to New York Design Studio, Incorporated, Far Rockaway, N.Y.
Filed Apr. 17, 1989, Ser. No. 339,370
Term of patent 14 years
U.S. Cl. D14—151



309,138
TELEPHONE SET WITH HANDSET TELEPHONE AND STAND THEREFOR HAVING KEYBOARD AND SPEAKERPHONE
Juan M. Azpeitia Ortiz de Arri, San Sebastian, Spain, assignor to Solac Telecom, S.A., Vitoria Alava, Spain
Filed Mar. 14, 1989, Ser. No. 323,634
Claims priority, application Spain, Sep. 15, 1988, 116861
Term of patent 14 years
U.S. Cl. D14—151

309,139
DIGITAL AUDIO COMPACT DISK PLAYER
Hiromi Okamoto, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Oct. 21, 1986, Ser. No. 922,118
Claims priority, application Japan, Apr. 24, 1986, 61-15428
Term of patent 14 years
U.S. Cl. D14—156

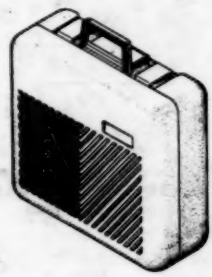


309,140
TAPE PLAYER
Youji Honda, Gunma, Japan, assignor to Sanyo Electric Co., Ltd., Osaka, Japan
Filed Jun. 30, 1987, Ser. No. 68,641
Claims priority, application Japan, Jan. 14, 1987, 62-991
Term of patent 14 years
U.S. Cl. D14—165

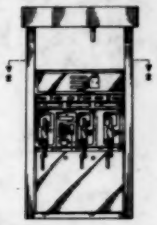
309,141
COMMUNICATIONS ANTENNA
Gershon N. Cooper, Los Angeles, Calif., assignor to Alliance Research Corporation, Chatsworth, Calif.
Filed Oct. 7, 1988, Ser. No. 254,668
Term of patent 14 years
U.S. Cl. D14—230

309,142
SUPPORT STAND FOR A DESK TELEPHONE
David A. Swisburne, P.O. Box 5710, Bethesda, Md. 20814
Filed Jan. 12, 1989, Ser. No. 296,425
Term of patent 14 years
U.S. Cl. D14—251

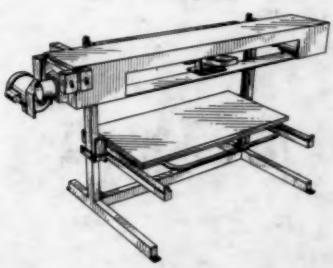
309,143
PACKAGED AIR COMPRESSOR SET
Muh-Chuan Yang, No.8, Lane 312, Sec. 3, Chungking S. Road, Taipei, Taiwan, assignor to Muh-Chuan Yang, Taipei, Taiwan
Filed Jul. 29, 1987, Ser. No. 79,491
Term of patent 14 years
U.S. Cl. D15—9



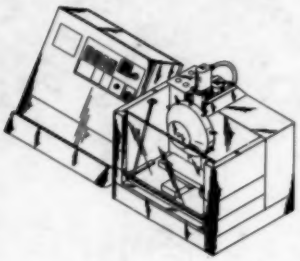
309,144
GASOLINE DISPENSING UNIT OR SIMILAR ARTICLE
Donald P. Austin, Jamestown; Albert L. Lawrence, Thomasville; Arthur C. Prewitt, Julian, all of N.C., and James E. Sacherman, Palo Alto, Calif., assignors to Gilbarco Inc., Greensboro, N.C.
Filed Sep. 15, 1988, Ser. No. 245,056
Term of patent 14 years
U.S. Cl. D15—9.2



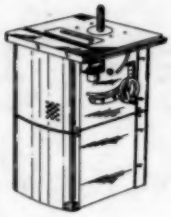
309,145
STROKE SANDER
John E. Miller, Jr., Kansas City, Mo., assignor to Woodmaster Tools, Inc., Kansas City, Mo.
Filed Apr. 5, 1988, Ser. No. 178,072
Term of patent 14 years
U.S. Cl. D15—124



309,146
VERTICAL MILLING CENTER
Winfried Nemetz, Oberalm, Austria, assignor to Maier & Co. Fabrik Fuer Spezialmaschinen, Hallein, Austria
Filed May 5, 1988, Ser. No. 190,514
Claims priority, application Austria, Jan. 15, 1988, 18907
Term of patent 14 years
U.S. Cl. D15—131



309,147
STAND FOR A WOODWORKING MACHINE
Peter Krouthaler, Gries, Austria, assignor to Maier & Co. Fabrik Fuer Spezialmaschinen, Hallein, Austria
Filed Apr. 26, 1988, Ser. No. 186,154
Term of patent 14 years
U.S. Cl. D15—133



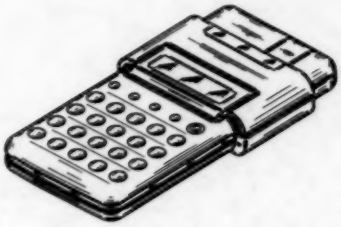
309,148
EYEWEAR
David A. Greufe, 2145 N. 31st St., Springfield, Oreg. 97477
Filed Jan. 25, 1988, Ser. No. 148,228
Term of patent 14 years
U.S. Cl. D16—102

309,149
EYEGLASS FRAME
Roger Pouilloux, Paris, France, assignor to Sporoptic Pouilloux S.A., Paris, France
Filed Aug. 17, 1987, Ser. No. 86,660
Claims priority, application France, Mar. 23, 1987, 87 1669
Term of patent 14 years
U.S. Cl. D16—102

309,150
MICROSCOPE HOUSING
John B. Wentz, 8619 Skyline Blvd., Oakland, Calif. 94611
Continuation-in-part of Ser. No. 58,422, Jun. 5, 1987, abandoned. This application Apr. 26, 1988, Ser. No. 186,980
Term of patent 14 years
U.S. Cl. D16—131

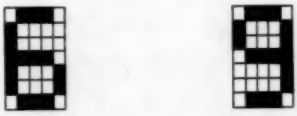
309,151
GUITAR
Jay T. Beard, 1630 S. Delaware St., San Mateo, Calif. 94401
Filed Dec. 18, 1987, Ser. No. 134,916
Term of patent 14 years
U.S. Cl. D17—18

309,152
ELECTRONIC CALCULATOR WITH PRINTER
Hiroshi Sakaguchi, and Yoko Ikuzawa, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Apr. 30, 1987, Ser. No. 44,492
Claims priority, application Japan, Nov. 5, 1986, 61-43758
Term of patent 14 years
U.S. Cl. D18—7

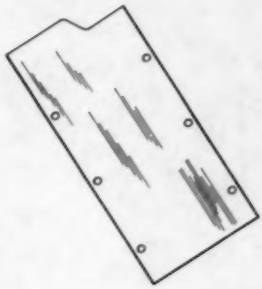


309,153
ELECTRONIC CALCULATOR
Masaji Sawada, and Toshiya Takahashi, both of Osaka, Japan, assignors to Sharp Corporation, Osaka, Japan
Filed Sep. 9, 1987, Ser. No. 94,922
Claims priority, application Japan, Apr. 8, 1987, 62-13677
Term of patent 14 years
U.S. Cl. D18—7

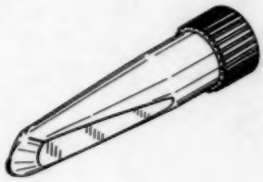
309,154
FONT OF TYPE
Kenneth D. Collister, Elkhart, Ind., assignor to Miles Inc., Elkhart, Ind.
Filed Dec. 5, 1988, Ser. No. 280,296
Term of patent 14 years
U.S. Cl. D18—27



309,155
INDEX CARD
Ally O. Hing, 1251 W. Main St., Superior, Ariz. 85273
Filed Mar. 1, 1988, Ser. No. 162,434
Term of patent 14 years
U.S. Cl. D19—1

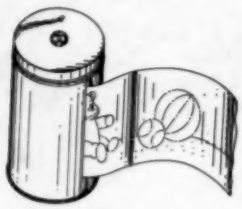


309,156
CHALK MARKER
Junichi Kuwahara, Osaka, Japan, assignor to Clover Manufacturing Co., Ltd., Osaka, Japan
Filed Mar. 2, 1987, Ser. No. 20,674
Term of patent 14 years
U.S. Cl. D19—41



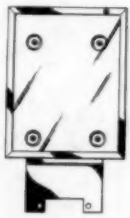
309,157
COMBINED WRITING INSTRUMENT HOLDER AND HAND SUPPORT
Paula Ertz, Newport Beach, Calif., assignor to Smith & Nephew Rolyan, Inc., Menomonee Falls, Wis.
Filed Jul. 1, 1987, Ser. No. 68,322
Term of patent 14 years
U.S. Cl. D19—55

309,158
COMBINED CRAYON CONTAINER AND COLORING STRIP
Herbert B. Shattan, New York, N.Y., assignor to Bob Shattan Associates, Inc., New York, N.Y.
Filed Dec. 8, 1986, Ser. No. 939,474
Term of patent 14 years
U.S. Cl. D19—89



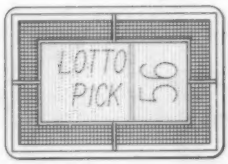
309,159
PLANT TAG
Robert C. Hickmott, Lansing, Mich., assignor to The John Henry Company, Lansing, Mich.
Continuation-in-part of Ser. No. 12,633, Feb. 9, 1987. This application Sep. 23, 1987, Ser. No. 100,079
Term of patent 14 years
U.S. Cl. D20—26

309,160
ADVERTISING FRAME FOR PAY TELEPHONE
Eddie L. Holland, Cumming, Ga., assignor to Phillips & Brooks, Inc., Cumming, Ga.
Filed Oct. 16, 1986, Ser. No. 919,645
Term of patent 14 years
U.S. Cl. D20—41



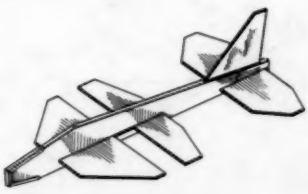
309,161
ELECTRONIC GAME HOUSING
Donny Leung, Tai Koo Shing, Hong Kong, assignor to Video Technology Industries, Inc., Wheeling, Ill.
Filed Oct. 14, 1987, Ser. No. 108,045
Term of patent 14 years
U.S. Cl. D21—13

309,162
LOTTO PICK CARDS
Larry Swalwell, Box 30, Madroua & Craig, R.R. #1, Nanoose Bay, B.C., V0R 2R0, Canada
Filed Jun. 22, 1987, Ser. No. 64,797
Term of patent 14 years
U.S. Cl. D21—37



309,163
GAME BOARD
Howard E. Jones, Box 20, P.O. North Beach, Western Australia, Australia 6020
Filed Jun. 30, 1987, Ser. No. 1,505
Term of patent 14 years
U.S. Cl. D21—31

309,164
MODEL AIRPLANE
Daniel M. Antonucci, 12 Earlswood Dr., Pittsburgh, Pa. 15228, assignor to Daniel M. Antonucci and David A. Celko, Pittsburgh, Pa.
Filed Feb. 29, 1988, Ser. No. 164,986
Term of patent 14 years
U.S. Cl. D21—89

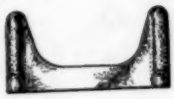


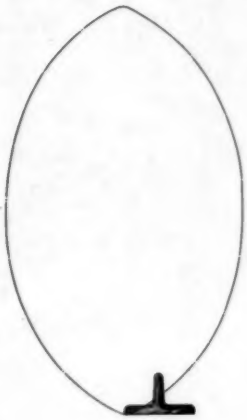
309,165
CHILDREN'S TOY
Andrew J. Kaplan, Portsmouth, and Charles E. Spinale, Barrington, both of N.H., assignors to Kiaderworks Corporation, Portsmouth, N.H.
Filed Oct. 31, 1986, Ser. No. 926,234
Term of patent 14 years
U.S. Cl. D21—106

309,166
TOY MOTOR CAR
Kazuo Ishida, Tokyo, Japan, assignor to Marusan Co., Ltd., Tokyo, Japan
Filed Aug. 2, 1988, Ser. No. 227,325
Claims priority, application Japan, Feb. 3, 1988, 63-4003
Term of patent 14 years
U.S. Cl. D21—136

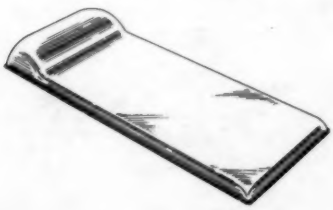
309,167
EXERCISE CYCLE
John Griffin, Salt Lake City, Utah, assignor to Weslo, Inc., Logan, Utah
Filed Apr. 18, 1988, Ser. No. 182,572
Term of patent 14 years
U.S. Cl. D21—194

309,168
PLACE KICKING TEE
John W. Smith, 4398 Cedar Ridge Trail, Stone Mountain, Ga. 30083
Filed Nov. 23, 1987, Ser. No. 123,986
Term of patent 14 years
U.S. Cl. D21—209





309,169
SWIMMING POOL FLOAT
Robert S. Scheurer, P.O. Box 539, Wichita Falls, Tex. 76307
Filed Dec. 10, 1987, Ser. No. 130,969
The portion of the term of this patent subsequent to Mar. 6, 2004, has been disclaimed.
Term of patent 14 years
U.S. Cl. D21—237



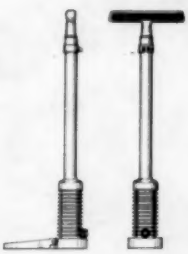
309,170
SPORTS GOAL
Jeff Bisch, 535 East Montecito St., Santa Barbara, Calif. 93103
Filed Oct. 15, 1987, Ser. No. 109,243
Term of patent 14 years
U.S. Cl. D21—201

309,171
FISHING REEL
Etsuo Hiraishi, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Aug. 20, 1987, Ser. No. 87,712
Claims priority, application Japan, Feb. 25, 1987, 62-7267
Term of patent 14 years
U.S. Cl. D22—141

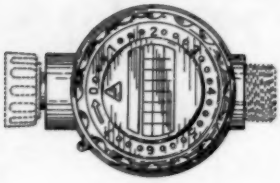
309,172
FISHING REEL
Etsuo Hiraishi, and Teruhisa Numata, both of Tokyo, Japan, assignors to Ryobi Ltd., Hiroshima, Japan
Filed Jan. 7, 1988, Ser. No. 141,658
Claims priority, application Japan, Jul. 21, 1987, 62-29654
Term of patent 14 years
U.S. Cl. D22—141

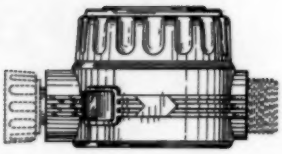
309,173
VACUUM BREAKER
Roger E. Stipe, Greensburg, Ind., assignor to Masco Corporation of Indiana, Taylor, Mich.
Filed Dec. 29, 1986, Ser. No. 947,533
Term of patent 14 years
U.S. Cl. D23—233

309,174
AIR PUMP
Masahiro Furusawa, 12-3, Ryouke 1-chome, Urawashi, Saitama-ken, Japan
Filed Feb. 11, 1988, Ser. No. 156,200
Claims priority, application Japan, Aug. 18, 1987, 62-33301; Aug. 18, 1987, 62-33308; Aug. 18, 1987, 62-33310; Aug. 18, 1987, 62-33311
Term of patent 14 years
U.S. Cl. D23—231



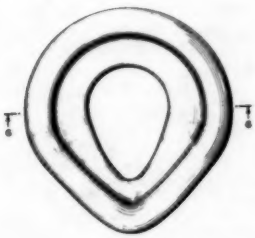
309,175
WATER CONTROL VALVE
Malcolm Hastings, Coventry, and John Lang, Bicester, both of England, assignors to Hozelock-ASL Limited, Haddenham, England
Filed Sep. 18, 1986, Ser. No. 909,083
Claims priority, application United Kingdom, Jun. 10, 1986, 1034683
Term of patent 14 years
U.S. Cl. D23—245



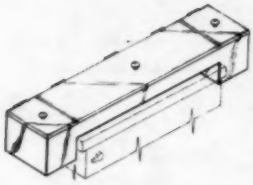


309,176
COMBINATION ADULT AND CHILD TOILET SEAT AND COVER
James R. Sessions, 127 Thayer Way, Vallejo, Calif. 94589
Filed Jun. 19, 1986, Ser. No. 876,355
Term of patent 14 years
U.S. Cl. D23—296

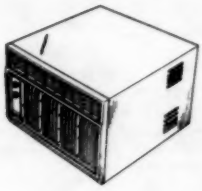
309,177
CHILD'S TOILET SEAT
Susan C. Weitzman, 516 W. Lafayette St., Easton, Pa. 18042
Filed Apr. 18, 1988, Ser. No. 182,578
Term of patent 14 years
U.S. Cl. D23—311



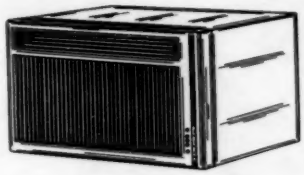
309,178
STORAGE CONTAINER FOR PLACEMENT ATOP A TOILET TANK
Charles A. Lowder, Sr., 705 S. Redwood Rd. #70, Salt Lake City, County of Salt Lake, Utah 84104
Filed Apr. 11, 1988, Ser. No. 184,031
Term of patent 14 years
U.S. Cl. D23—313



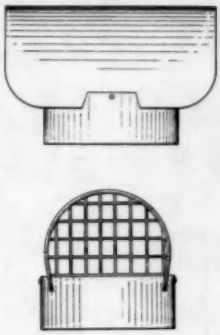
309,179
AIR CONDITIONER
Suk J. Choi, Seoul, Rep. of Korea, assignor to Goldstar Co., Ltd., Seoul, Rep. of Korea
Filed Mar. 4, 1988, Ser. No. 164,120
Term of patent 14 years
U.S. Cl. D23—353



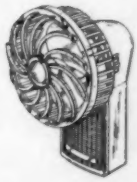
309,180
AIR CONDITIONER
Hiroshi Moritani, Osaka, Japan, assignor to Sharp Corporation, Osaka, Japan
Filed Nov. 25, 1987, Ser. No. 125,053
Claims priority, application Japan, Jun. 4, 1987, 62-23043
Term of patent 14 years
U.S. Cl. D23—353



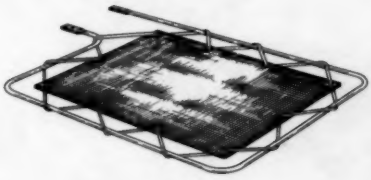
309,181
RADON EXHAUST VENT CAP
Ronald F. Simon, R.D. 2, Box 481, Barto, Pa. 19504
Filed Oct. 25, 1988, Ser. No. 262,005
Term of patent 14 years
U.S. Cl. D23—371



309,182
POCKET FAN OR SIMILAR ARTICLE
Chin-Tien Hsu, No. 7, Lane 120, Hu-Lin St., Taipei, Taiwan
Filed Jun. 24, 1988, Ser. No. 211,716
Term of patent 14 years
U.S. Cl. D23—382



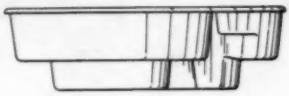
309,183
CEILING FAN BLADE
William N. Taylor, III, 2914 Shady Lake Cir., Carrollton, Tex. 75006
Filed Mar. 29, 1988, Ser. No. 174,639
Term of patent 14 years
U.S. Cl. D23—413

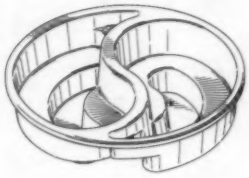


309,184
SURGICAL SUPPORT STAND FOR USE IN ARTHROSCOPIC SURGERY OF THE SHOULDER OR THE LIKE
Ronald A. Sanderson, Calabasas; John L. Wilson, Granada Hills, and Nolan Maples, Burbank, all of Calif., assignors to Cal-Surgical, Inc., Bishop, Calif.
Filed Jun. 18, 1987, Ser. No. 63,517
Term of patent 14 years
U.S. Cl. D24—1.1

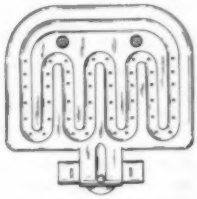
309,185
COMBINED CEMENTING TOOL AND VIBRATORY ROD FOR DENTAL APPLICATIONS
Stephen J. Lockawich, Concord, N.H., assignor to Herbert L. Stiles and Lawrence J. Joyce, both of Penacook, N.H.
Filed May 20, 1988, Ser. No. 197,083
Term of patent 14 years
U.S. Cl. D24—10

309,186
DUAL-CHAMBERED HYDRO TUB SPA
John W. Hargrove, Houston, Tex., assignor to Nancy A. Brown, Houston, Tex.
Filed May 4, 1987, Ser. No. 46,861
Term of patent 14 years
U.S. Cl. D24—38

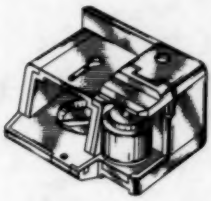




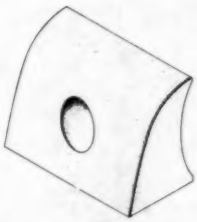
309,187
BUBBLING BATH BACK PAD
Francois Geneve, and Luc Heiligenstein, both of Chicago, Ill., assignors to Associated Mills Inc., Chicago, Ill.
Filed Jun. 30, 1988, Ser. No. 214,108
Term of patent 14 years
U.S. Cl. D24—38



309,188
MEDICATION INFUSION CASSETTE
Lanny A. Gorton, Sunland, Calif., assignor to Pacesetter Infusion, Ltd., Sylmar, Calif.
Filed Dec. 1, 1987, Ser. No. 128,532
Term of patent 14 years
U.S. Cl. D24—51

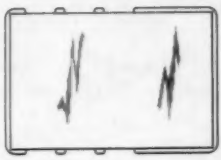


309,189
BLOCK FOR SUPPORTING THE HEAD OF AN INJURED INDIVIDUAL
Colleen M. Bowlin, San Antonio, Tex., assignor to ErgoMed, Inc., San Antonio, Tex.
Filed Apr. 11, 1989, Ser. No. 336,300
Term of patent 14 years
U.S. Cl. D24—64



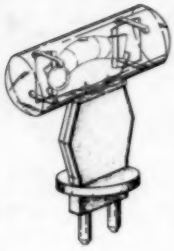
309,190
SERVICE BUILDING AND THE LIKE
Alan E. Goldberg, New Caanan, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 22, 1987, Ser. No. 111,462
Term of patent 14 years
U.S. Cl. D25—34

309,191
SERVICE BUILDING AND THE LIKE
Alan E. Goldberg, New Caanan, Conn., assignor to Mobil Oil Corporation, New York, N.Y.
Filed Oct. 22, 1987, Ser. No. 111,461
Term of patent 14 years
U.S. Cl. D25—34



309,192
TILE
Luigi Colani, Bern, Switzerland, assignor to Agrob AG, Fed. Rep. of Germany
Filed Jun. 29, 1987, Ser. No. 67,809
Claims priority, application Fed. Rep. of Germany, Dec. 29, 1986, 17013
Term of patent 14 years
U.S. Cl. D25—138

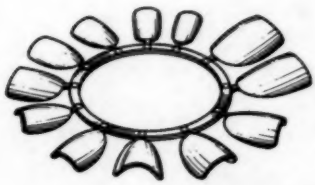
309,193
LAMP
Kirti B. Chakrabarti, Danvers, Mass.; Donald F. Garrity, Jr., Chester, N.H., and James L. Cashman, III, Salem, Mass., assignors to GTE Products Corporation, Danvers, Mass.
Filed Dec. 16, 1986, Ser. No. 942,641
Term of patent 14 years
U.S. Cl. D26—2



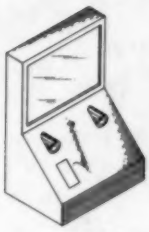
309,194
LIGHT DIFFUSER
Alan A. Archambault, Smithfield; Nicholas R. Palumbo, Cumberland, and Lyn C. Fletcher, East Providence, all of R.I., assignors to General Electric Company, Schenectady, N.Y.
Filed Nov. 24, 1986, Ser. No. 934,085
Term of patent 14 years
U.S. Cl. D26—125

309,195
HAND DRYER
Joseph J. Pilolla, Elmhurst; John R. Wilson, Naperville; Steven C. Meier, and James Kendall, both of Chicago, all of Ill., assignors to Sloan Valve Company, Franklin Park, Ill.
Filed Sep. 21, 1987, Ser. No. 99,052
Term of patent 14 years
U.S. Cl. D28—54.1

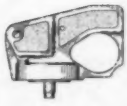
309,196
ARTIFICIAL NAIL SIZING RING
Aldran H. LaJoie, Mission Viejo, Calif., assignor to Cosmar Corporation, Huntington Beach, Calif.
Filed Mar. 10, 1988, Ser. No. 166,173
Term of patent 14 years
U.S. Cl. D28—56



309,197
HAIRSTYLING PROJECTION SCREEN
Joseph K. Williams, Jr., 3001 Orleans Ave., New Orleans, La. 70119
Filed Feb. 18, 1986, Ser. No. 834,046
Term of patent 14 years
U.S. Cl. D28—99

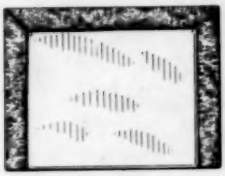


309,198
HANDLE FOR FIRE EXTINGUISHER
Esmat Macramalla, Beaconsfield, Canada, assignor to Incendex Inc., Quebec, Canada
Filed Mar. 4, 1988, Ser. No. 165,882
Term of patent 14 years
U.S. Cl. D29—5

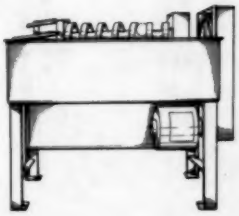


309,199
BED FOR PETS
Franklin McMahon, New York, N.Y., assignor to Univier International Corporation, Dallas, Tex.
Filed Mar. 9, 1988, Ser. No. 165,900
Term of patent 14 years
U.S. Cl. D30—118

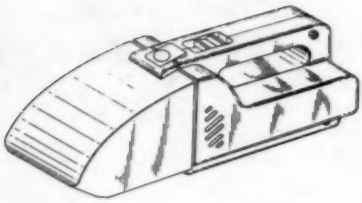
309,200
BED FOR PETS
Franklin McMahon, New York, N.Y., assignor to Canon Kabushiki Kaisha, Tokyo, Japan
Filed Mar. 9, 1988, Ser. No. 165,560
The portion of the term of this patent subsequent to May 24, 2002, has been disclaimed.
Term of patent 14 years
U.S. Cl. D30—118



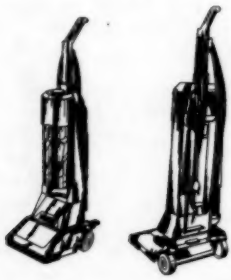
309,201
GOLF BALL WASHING MACHINE
Derone W. Thrasher, 26661 S. MacArthur, Tracy, Calif. 95376
Filed Nov. 2, 1987, Ser. No. 115,097
Term of patent 14 years
U.S. Cl. D32—1



309,202
RECHARGEABLE VACUUM CLEANER
John S. Yuen, Kowloon, Hong Kong, assignor to John Manufacturing Limited, Kowloon, Hong Kong
Filed Mar. 6, 1987, Ser. No. 22,986
Claims priority, application United Kingdom, Oct. 17, 1986, 1037474
The portion of the term of this patent subsequent to Nov. 28, 2003, has been disclaimed.
Term of patent 14 years
U.S. Cl. D32—18



309,203
VACUUM CLEANER
Gordon W. Goodrich, Grand Rapids, Mich., assignor to Amway Corporation, Ada, Mich.
Filed Sep. 4, 1987, Ser. No. 93,394
Term of patent 14 years
U.S. Cl. D32—22



309,204
VACUUM CLEANER
John F. Sovis, Twinsburg; James J. Kopco, Richmond Heights; Jeffrey M. Kalman, Cleveland Heights, and Craig M. Saunders, Sagamore Hills, all of Ohio, assignors to Royal Appliance Manufacturing Co., Cleveland, Ohio
Filed Sep. 22, 1987, Ser. No. 99,510
Term of patent 14 years
U.S. Cl. D32—22

309,205
VACUUM CLEANER NOZZLE
Wilhelm Schuster, Heidelberg, Fed. Rep. of Germany, assignor to Allstar Verbrauchsguter GmbH, Fed. Rep. of Germany
Filed Mar. 24, 1987, Ser. No. 29,822
Claims priority, application Fed. Rep. of Germany, Sep. 24, 1986, DM/007521
Term of patent 14 years
U.S. Cl. D32—32

309,206
SCRAPER FOR REMOVING FROST FROM WINDSHIELDS OR THE LIKE
Jeremy J. Kelley, P.O. Box 611, Cordova, Ak. 99574
Filed Dec. 11, 1987, Ser. No. 131,523
Term of patent 14 years
U.S. Cl. D32—46

309,207
CLOTHESPIN
James S. Sporer, 204 Lamberton St., Franklin, Pa. 16323
Filed Aug. 6, 1987, Ser. No. 82,370
Term of patent 14 years
U.S. Cl. D32—61

309,208
TRASH CONTAINER
Ralph Cajigas, 3540 W. First Ave., Hialeah, Fla. 33012
Filed Sep. 2, 1988, Ser. No. 239,837
Term of patent 14 years
U.S. Cl. D34—4

309,209
LITTER BIN FOR USE IN CARS
Arie G. Oliemans, Houten, and Johan H. Visser, Bilthoven, both of Netherlands, assignors to Deanco Investment Company, Ltd., Clarons, Switzerland
Filed Jan. 11, 1988, Ser. No. 142,771
Claims priority, application Hague, Jul. 10, 1987, DM/008935
Term of patent 14 years
U.S. Cl. D34—9

LIST OF PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

A. Ahlstrom Corporation: *See*—
Hiltunen, Matti; Lundqvist, Ragnar; and Sarkki, Juha, 4,940,007, Cl. 110-347.000.

Abbiate, Jean-Claude; Blanc, Alain; Jeanniot, Patrick; and Lallemand, Eric, to Internationl Business Corporation. Predictive clock recovery circuit. 4,941,151, Cl. 375-20.000.

Abbott Laboratories: *See*—
Davis, Charles L., 4,941,201, Cl. 455-41.000.
Kazlauskas, Vidas P.; Janczak, Roger A.; and Durley, Benton A., III, 4,940,527, Cl. 204-401.000.

Abe, Yasunao: *See*—
Ishida, Takashi; and Abe, Yasunao, 4,939,974, Cl. 84-609.000.

Abeles, Joseph H.; and Deri, Robert J., to Bell Communications Research, Inc. Optical system comprising non-uniformly spaced array of parallel optical waveguide elements. 4,940,303, Cl. 350-96.110.

Abend, Thomas; and Lauchenauer, Max, to EMS-Togo AG. Plastisol molding material. 4,940,748, Cl. 524-521.000.

Aberson, James A.; DeFabritis, Raymond P.; Ridgway, David N.; and Vicory, William A., to AT&T Bell Laboratories. Optical fiber splice. 4,940,307, Cl. 350-96.210.

Abott, Richard A.; Ringe, Stephen J.; and Keeler, Michael J., to Fruehauf Corporation. Cargo vehicle wall construction. 4,940,279, Cl. 296-181.000.

Abou-Gharbia, Magid A.: *See*—
Childers, Wayne E., Jr.; and Abou-Gharbia, Magid A., 4,940,789, Cl. 540-581.000.

Abraham, Dennis G.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Achenbach Buschhutten GmbH: *See*—
Stahl, Werner; and Barten, Axel, 4,939,920, Cl. 72-237.000.

Ackeret, Peter, to Licinvest AG. Cyclic rearrangement device for stacked rectangular sheets. 4,939,860, Cl. 40-513.000.

ACO Polymer Products, Inc.: *See*—
Van Duyn, Phillip L.; Barenwald, Jorg R.; and Kruse, Kenneth E., 4,940,359, Cl. 405-118.000.

Actel Corporation: *See*—
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., 4,941,028, Cl. 357-23.130.

Adachi, Masakazu; and Fukao, Kaname, to NGK Insulators, Ltd. Method of producing non-oxide ceramic sintered bodies. 4,940,843, Cl. 264-65.000.

Adachi, Yoshiharu; Kuwana, Kazutaka; and Yoshida, Tsuyoshi, to Aisin Seiki Kabushiki Kaisha. Brake pressure control device. 4,940,295, Cl. 303-117.000.

Adair, Paul C.: *See*—
Davis, Paul D.; Hillenbrand, Gary F.; and Adair, Paul C., 4,940,645, Cl. 430-438.000.

Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, to NKK Corporation. Plated steel sheet for a can. 4,940,638, Cl. 428-648.000.

ADC Telecommunications, Inc.: *See*—
Raczynacher, Kevin A.; Dean, Dennis R.; Dixon, Jerry L., Sr.; and Szklarz, Robert J., 4,941,165, Cl. 379-1.000.

Aderhold, James L.: *See*—
Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., 4,940,530, Cl. 208-89.000.

Adkins, Richard C., to British Aerospace PLC. Jet pump with stabilized mixing of primary and secondary flows. 4,940,392, Cl. 417-151.000.

Advanced Cardiovascular Systems, Inc.: *See*—
Hampton, Hilary J.; Gaiser, John W.; Taylor, Charles S.; and Machold, Timothy R., 4,940,062, Cl. 128-772.000.

Advanced Micro Devices, Inc.: *See*—
Haubursin, Pierre F., 4,941,126, Cl. 364-900.000.
Sfarti, Adrian, 4,941,111, Cl. 364-521.000.
Tran, Thang M., 4,940,908, Cl. 307-443.000.

Advanced NMR Systems, Inc.: *See*—
Rzedzian, Richard R., 4,940,941, Cl. 324-312.000.

AE PLC: *See*—
Fletcher-Jones, David F., 4,939,984, Cl. 92-176.000.

Aebi, Gilbert; Raye, Pierre; David, Maurice J. A.; and Marianneau, Michel E. A., to Stellram S.A. Milling cutter with indexable inserts. 4,940,369, Cl. 407-42.000.

Aebi, Rudolf; Hubele, Adolf; and Speich, Jurg, to Ciba-Geigy Corporation. Preparation of the diastereomeric mixture 2R,4S-1-[2-(2,4-dichlorophenyl)-4-n-propyl-1,3-dioxolan-2-ylmethyl]-1H-1,2,4-triazole. 4,940,799, Cl. 548-268.800.

AECI Limited: *See*—
Curutchet, Jean L.; du Plessis, Michael P.; and Crane, Andre P., 4,939,993, Cl. 102-202.140.

Aerospatiale Societe Nationale Industrielle: *See*—
Castelain, Yves; Jaubert, Philippe; and Peltier, Rene , 4,940,382, Cl. 414-750.000.

Agency of Industrial Science and Technology, President of: *See*—
Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,940,684, Cl. 502-178.000.

Agency of Industrial Science & Technology, Ministry of Industrial Trade & Industry: *See*—
Kamei, Hirotake, 4,940,057, Cl. 128-653.00A.

Agfa-Gevaert Aktiengesellschaft: *See*—
Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, 4,940,653, Cl. 430-502.000.

Aihara, Yasuyuki; Kano, Hideki; Tsuchiya, Yoshikazu; and Miyazaki, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Connector apparatus. 4,940,423, Cl. 439-369.000.

Aihara, Yoshihiko; and Suzuki, Masayuki, to Canon Kabushiki Kaisha. Camera. 4,941,010, Cl. 354-407.000.

Air Products and Chemicals, Inc.: *See*—
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Santangelo, Joseph G., 4,940,733, Cl. 521-79.000.
Pellman, Mark A.; Kilhefner, Paul T., III; and Hahn, Terrence S., 4,940,072, Cl. 164-35.000.

Aisin Seiki Kabushiki Kaisha: *See*—
Adachi, Yoshiharu; Kuwana, Kazutaka; and Yoshida, Tsuyoshi, 4,940,295, Cl. 303-117.000.
Karnopp, Dean C.; and Yasui, Yoshiyuki, 4,941,097, Cl. 364-424.050.
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 4,940,119, Cl. 188-73.310.
Nishii, Michiharu; Tada, Yoshihiko; and Mizuno, Genji, 4,940,290, Cl. 303-6.010.
Suzuki, Saburo; Nawa, Hiroshi; and Ito, Sadao, 4,940,285, Cl. 297-473.000.

Aisin-Warner Kabushiki Kaisha: *See*—
Ito, Yasunobu; and Suzuki, Kenji, 4,941,096, Cl. 364-424.100.

Aitken, Bruce G., to Corning Incorporated. Rare earth oxynitride glasses. 4,940,678, Cl. 501-73.000.

Aizawa, Motohiro; Ohsumi, Katsumi; Honda, Takashi; and Itow, Hisao, to Hitachi, Ltd.; and Hitachi Engineering Co., Ltd. Suppression of deposition of radioactive substances in boiling water type, nuclear power plant. 4,940,564, Cl. 376-306.000.

Ajinomoto Co., Inc.: *See*—
Miwa, Harufumi; Kashiwada, Minoru; and Yahagi, Yoshimasa, 4,940,332, Cl. 356-417.000.

Akademie der Wissenschaften der DDR: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.

Akagawa, Keiiti: *See*—
Ohmine, Toshimitsu; Honda, Takaaki; and Akagawa, Keiiti, 4,940,213, Cl. 266-152.000.

Akcelrod, Patrick, to Societe Anonyme dite: Etablissements Tasserit. Orthopedic operating table for limbs, and in particular for the lower limbs. 4,940,218, Cl. 269-322.000.

Akers, Albert L.; Carpenter, Robert M.; Freeman, William D.; and Passafiume, John E., to International Business Machines Corporation. Platen controlled sheetfeed permitting back-up for erasure. 4,940,348, Cl. 400-624.000.

Akimoto, Kunio: *See*—
Matsubara, Akitoshi; Ikeuchi, Satoru; Akimoto, Kunio; and Takizawa, Yoshio, 4,940,644, Cl. 430-109.000.

Akiyama, Takeo: *See*—
Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,940,684, Cl. 502-178.000.

Aktiebolaget Electrolux: *See*—
Larsson, Anders E. C.; Svanberg, Joakim A.; Kilstrom, Lars G.; and Tuvin, Lars G., 4,940,474, Cl. 55-210.000.

Akzo NV: *See*—
Baurmeister, Ulrich, 4,940,617, Cl. 428-36.300.

Albany International Corp.: *See*—
Krebs, David J., 4,940,515, Cl. 162-363.000.

Albrecht, Kenneth D. Engine prelubricating system. 4,940,114, Cl. 184-6.300.

Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, to BASF Aktiengesellschaft. Photopolymerizable recording materials and photoresist layers and lithographic printing plates based thereon. 4,940,649, Cl. 430-281.000.

Alexander, James R.; Johnson, Acie G.; and Prentice, Glenn W., to Emerging Technologies, Inc. Laser aiming device for firearms, archery bows, and crossbows. 4,939,863, Cl. 42-103.000.

Alfred Kunz GmbH & Co.: *See*—
Schuhbauer, Alfred, 4,939,878, Cl. 52-169.140.

Alfred Teves GmbH: *See*—
Saalbach, Kurt; and Bergelin, Kurt, 4,939,901, Cl. 60-562.000.
Schmidt, Bodo; and Krause, Helmut, 4,940,120, Cl. 188-73.360.

Aljoe, Ronald R.: *See*—
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., 4,940,621, Cl. 428-137.000.

Allen, Dillis V. Computer golf club. 4,940,236, Cl. 273-183.00D.

Allen, Ioan R.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,941,177, Cl. 381-22.000.

Allen, Robert H.; Stabler, Sally P.; and Lindenbaum, John, to University Patents, Inc. Assay for sulfhydryl amino acids and methods for detecting and distinguishing cobalamin and folic acid deficency. 4,940,658, Cl. 435-4.000.

Allied Colloids Limited: *See*—
Flesher, Peter; Farrar, David; Hawe, Malcolm; and Langley, John, 4,940,763, Cl. 526-307.000.

Allied-Signal, Inc.: *See*—
Bassman, Robert G., 4,941,110, Cl. 364-521.000.
Yates, Stephen F., 4,940,824, Cl. 570-179.000.
Yates, Stephen F., 4,940,825, Cl. 570-179.000.

Allspach, Thomas: *See*—
Folda, Thomas; and Allspach, Thomas, 4,940,740, Cl. 523-428.000.

Alperson, Joel H. Retail display wire cube. 4,940,148, Cl. 211-181.000.

Alteepping, Josef; and Nebe, Juergen P., to Amoco Corporation. Production of low density polypropylene foam. 4,940,736, Cl. 521-98.000.

Alternative Energy Research Center Inc.: *See*—
Katz, Beatriz E., 4,940,973, Cl. 340-764.000.

Aluminum Company of America: *See*—
Martin, Diane D., 4,940,078, Cl. 164-472.000.

Alusuisse-Lonza Services Ltd.: *See*—
Cummings, Michael A., 4,940,489, Cl. 75-407.000.

Alza Corporation: *See*—
Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., 4,940,586, Cl. 424-464.000.

Amand, Yvon, to Societe d'Applications Generales d'Electricite et de Mecanique. Pendular non-servoed tuning beam accelerometer. 4,939,935, Cl. 73-517.0AV.

Amano Corporation: *See*—
Matunaga, Akira; Inoue, Hideo; Ikezawa, Ken; and Arai, Tetu, 4,939,811, Cl. 15-385.000.

Amano, Juichi, to Nippon Thompson Co., Ltd. Endless rectilinear motion rolling guide unit. 4,940,339, Cl. 384-25.000.

Amcor Limited: *See*—
Groves, Maurice C., 4,940,190, Cl. 229-122.000.

American Advantage Company: *See*—
Nichols, Joseph W., 4,940,324, Cl. 356-247.000.

American Cyanamid: *See*—
Ley, David A.; Hiscock, Laura J.; and Cooke, Michael T., 4,940,734, Cl. 521-84.100.

American Cyanamid Company: *See*—
Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, 4,940,710, Cl. 514-254.000.

American Dental Laser, Inc.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.

American Filtrona Corporation: *See*—
Jaisinghani, Raian A.; and Bugli, Neville J., 4,940,470, Cl. 55-2.000.

American Home Products Corporation: *See*—
Childers, Wayne E., Jr.; and Abou-Gharbia, Magid A., 4,940,789, Cl. 540-581.000.

American National Can Company: *See*—
Farrell, Christopher J.; Hlobil, Thomas; and Nahill, George F., 4,940,158, Cl. 220-258.000.

American Standard Inc.: *See*—
Wood, James A.; and Mazur, Richard J., 4,941,099, Cl. 364-426.020.

American Telephone and Telegraph Company: *See*—
Rysewyk, Ambrose L., 4,940,381, Cl. 414-619.000.

Ammermann, Eberhard: *See*—
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.

Ammon, Robert L.; Buckman, Raymond W., Jr.; and Bajaj, Ram, to Westinghouse Electric Corp. Method of making a high velocity armor penetrator. 4,940,404, Cl. 419-28.000.

Amoco Corporation: *See*—
Alteepping, Josef; and Nebe, Juergen P., 4,940,736, Cl. 521-98.000.
Beaton, William I.; Taylor, James L.; Peck, Lawrence B.; and Mosby, James F., 4,940,529, Cl. 208-61.000.
Cengel, John A.; and Pappas, Peter G., 4,940,552, Cl. 252-51.50A.
Fisher, William F.; and Young, Grant A., 4,940,535, Cl. 209-250.000.
Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., 4,940,530, Cl. 208-89.000.
Yokelson, Howard B.; Partenheimer, Walter; and Gipe, Robert, 4,940,810, Cl. 556-438.000.

Amos, Dennis R.: *See*—
Clark, Robert E.; and Amos, Dennis R., 4,940,390, Cl. 416-241.00R.

AMP Incorporated: *See*—
Consoli, John J.; and Hoffman, Norman E., 4,940,432, Cl. 439-862.000.
Fisher, David W.; and Frishkorn, Eric T., 4,940,892, Cl. 250-227.240.
Hass, Juergen; and Hotea, Gheorghe, 4,940,425, Cl. 439-397.000.
Redmond, John P.; and Shaak, Ray N., 4,940,426, Cl. 439-495.000.

Amra, Lutfi H.; Byrne, Thomas M., Jr.; Martin, Harvey; Mordue, George S.; and Neff, David V., to Carborundum Company, The. Molten metal pump with filter. 4,940,384, Cl. 415-121.200.

Amso Co., Ltd.: *See*—
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Youji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, 4,939,867, Cl. 49-349.000.

Analog Devices, Inc.: *See*—
Tice, Thomas E., 4,940,980, Cl. 341-159.000.

Anderle, Sonia K.: *See*—
Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., 4,940,723, Cl. 514-396.000.

Anderson, Robert S. Process for printing continuous stripe and product thereof. 4,940,625, Cl. 428-195.000.

Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., to Corning Incorporated. Process to encapsulate graphite into glass and glass ceramic articles, and articles manufactured by this process. 4,940,635, Cl. 428-408.000.

Androy, Gilbert G. T-top roofing system. 4,940,283, Cl. 296-216.000.

Andus Corporation: *See*—
Kittler, Wilfred C., Jr.; Czukor, Janos; and Stoddard, Darrell, 4,940,627, Cl. 428-203.000.

Anetsberger Brothers, Inc.: *See*—
Smith, Mark J., 4,939,987, Cl. 99-468.000.

Anquita, Manuel: *See*—
Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, 4,940,706, Cl. 514-231.500.

Anritsu Corporation: *See*—
Katayama, Aiichi; and Kon, Kenichi, 4,940,931, Cl. 324-121.00R.

Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, to Mitsubishi Rayon Company, Ltd. Process for preparation of methacrylimide group-containing polymer. 4,940,778, Cl. 528-481.000.

Aoki, Hideo: *See*—
Komai, Hiroshi; and Aoki, Hideo, 4,941,015, Cl. 355-200.000.

Aoki, Syozo; Kuse, Satoru; and Koboshi, Shigeharu, to Konishiroku Photo Industry Co., Ltd. Waste solution treatment method and apparatus therefor. 4,940,134, Cl. 202-202.000.

Aoyagi, Juuro, to Tokyo Bi-Tech Laboratories, Inc. Blood cleaning hollow fiber membrane, method for cleaning blood, and apparatus therefor. 4,940,541, Cl. 210-321.800.

Aoyagi, Yuuji; and Kageyama, Seiji, to Hitachi, Ltd. Interface for sending printer request signals to a printer. 4,941,108, Cl. 364-519.000.

Aoyama, Noboru: *See*—
Ono, Takuro; Aoyama, Noboru; and Morinaga, Kaoru, 4,941,140, Cl. 369-264.000.

Apap, Marc F. C.; Thorin, Cedric L. M. C.; Rosenstatter, Otto; and Malata, Peter, to Dentalwerk Burmoos Gesellschaft m.b.H. Dental tool holder. 4,940,410, Cl. 433-102.000.

Apollo Computer, Inc.: *See*—
Williams, James B., 4,940,929, Cl. 323-222.000.

Apricot S.A.: *See*—
Lo, Shui-Yin, 4,940,893, Cl. 250-251.000.

Aquatec: *See*—
Hancock, Mark W.; and May, Marvin M., 4,940,164, Cl. 222-66.000.

Aquino, Agostino; and Lang, Karl U., to Nabisco Brands, Inc. Method of controlling the flow of bakery and other items. 4,940,130, Cl. 198-432.000.

Arai, Takayoshi: *See*—
Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,940,642, Cl. 430-65.000.

Arai, Tetu: *See*—
Matunaga, Akira; Inoue, Hideo; Ikezawa, Ken; and Arai, Tetu, 4,939,811, Cl. 15-385.000.

Arai, Yuji: *See*—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 4,940,618, Cl. 428-64.000.

Araki, Kazuhiro: *See*—
Mishima, Nobuhiro; and Araki, Kazuhiro, 4,941,017, Cl. 355-218.000.

Araki, Kazunori: *See*—
Kawasaki, Hisamitsu; Nakashima, Kunimichi; Araki, Kazunori; and Mizuno, Tsuyoshi, 4,939,834, Cl. 29-568.000.

Araya Industrial Co., Ltd.: *See*—
Hashimoto, Masaki; and Yamaguchi, Noboru, 4,940,356, Cl. 403-266.000.

Arc Sonics Inc.: *See*—
Nyberg, Christopher A.; Jackson, James G.; and Brdicko, Jan, 4,941,134, Cl. 367-142.000.

Arita, Yoshihiro: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Arizona Board of Regents: *See*—
Pettit, George R.; and Singh, Sheo B., 4,940,726, Cl. 514-450.000.

Armistead, Trevor: *See*—
Chambers, Jeffrey; Armistead, Trevor; and Frodsham, John C., 4,940,429, Cl. 439-608.000.

Armstrong, Orville D. Vehicle frame alignment gauge. 4,939,848, Cl. 33-608.000.

Armstrong, Randolph K.: *See*—
Steele, David S.; Armstrong, Randolph K.; and Snider, David E., 4,940,944, Cl. 324-425.000.

Aronson, Herbert R., to Salant Corporation. Adjustable neck and cuff closures for dress shirts. 4,939,794, Cl. 2-128.000.

Arques, Marc: *See*—
Henry, Yves; and Arques, Marc, 4,940,901, Cl. 250-370.090.

Arzel, Anne-Marie: *See*—
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, 4,941,112, Cl. 364-527.000.

Asahi Glass Company, Ltd.: *See*—
Sato, Yasuo; Saito, Tsunehiro; Kamioka, Toshihito; Yoshikawa, Yukio; and Yoshikawa, Masaaki, 4,940,479, Cl. 65-99.200.

Asahi Kasei Kogyo Kabushiki Kaisha: *See*—
Okada, Ken-ichi; and Kasahara, Hideo, 4,940,753, Cl. 525-68.000.

Asakawa, Stuart D., to Hewlett-Packard Company. Carriage for ink jet printer. 4,940,998, Cl. 346-140.00R.

Asano, Hiroshi; and Ishii, Shigeru, to Nissan Motor Co., Ltd. Line pressure control arrangement for automatic transmission. 4,939,957, Cl. 74-866.000.

Asano, Hiroshi: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

ASEA Aktiebolag: *See*—
Kap, Mladen, 4,941,087, Cl. 364-200.000.

Asea Brown Boveri Aktiengesellschaft: *See*—
Fabianowski, Jan; and Ibach, Robert, 4,941,077, Cl. 363-49.000.
Von Thun, Hans-Jurgen, 4,939,985, Cl. 73-118.100.

Ashida, Takashi; and Yamamoto, Koji, to Idemitsu Petrochemical Co., Ltd. Method for the preparation of a polycarbonate powder. 4,940,779, Cl. 528-495.000.

Ashland Oil, Inc.: *See*—
Goel, Anil B., 4,940,769, Cl. 528-85.000.

Ashworth Bros., Inc.: *See*—
Roinestad, Gerald C.; and Straight, Michael R., 4,940,133, Cl. 198-831.000.

Aspen, Frank E.: *See*—
Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank R.; Gilbert, James R.; and Aspen, Frank E., 4,940,495, Cl. 136-256.000.

Asten Group, Inc.: *See*—
Penven, Patrick H., 4,940,630, Cl. 428-234.000.

At Ease Enterprises, Inc.: *See*—
Van Hovel, Brian V., 4,939,799, Cl. 4-578.000.

AT&T Bell Laboratories: *See*—
Aberson, James A.; DeFabritiis, Raymond P.; Ridgway, David N.; and Vicory, William A., 4,940,307, Cl. 350-96.210.
Wei, Lee-Fang, 4,941,154, Cl. 375-39.000.

Ataka, Yasukazu, to Sharp Kabushiki Kaisha. Portable vacuum cleaner. 4,939,810, Cl. 15-347.000.

Atlantic Richfield Company: *See*—
Baillie, Lloyd A., 4,939,850, Cl. 34-10.000.
McCreary, Robert A., Jr., 4,939,855, Cl. 37-103.000.

Atlas Powder Company: *See*—
VanOmmeren, Catharine L., 4,940,497, Cl. 149-2.000.

Atwell, William A.: *See*—
Yasosky, John J.; Hahn, Patricia W.; and Atwell, William A., 4,940,595, Cl. 426-243.000.

Aubert, Donald E.; Wu, You-Sun; and Nerurkar, Vishnu W., to General Electric Company. Unbalanced quadrature PSK modulator-limiter. 4,940,954, Cl. 332-103.000.

Aucoin, Thomas R.: *See*—
Shappirio, Joel R.; Aucoin, Thomas R.; and Finnegan, John J., 4,940,693, Cl. 505-1.000.

AUDI AG: *See*—
Bauder, Armin, 4,940,101, Cl. 180-69.400.

Auhorn, Werner: *See*—
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Webern-doerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, 4,940,514, Cl. 162-168.200.

Aumueller, Alexander; Spang, Peter; Neumann, Peter; and Trauth, Hubert, to BASF Aktiengesellschaft. 2,6-polyalkylpiperidine-substituted benzimidazole-2-carboxanilides and their use for stabilizing organic material. 4,940,742, Cl. 524-93.000.

Aurand, Kenneth; and Blair, James F. L., to Saint Switch, Inc. Floating operating and release paint switch actuator. 4,940,864, Cl. 200-342.000.

Austin, Richard A. Apparatus and method for matching radiator and feedline impedances and for isolating the radiator from the feedline. 4,940,989, Cl. 343-749.000.

Autopan Heimerdinger & Stabler GmbH & Co.: *See*—
Nissler, Siegfried; and Radomirevic, Miroslav, 4,941,007, Cl. 354-320.000.

Autovend, Inc.: *See*—
Thie, Matthew G., 4,940,162, Cl. 221-129.000.

Auxier, Robert W.: *See*—
Wilkerson, Ivan E.; and Auxier, Robert W., 4,940,011, Cl. 116-277.000.

Avantek, Inc.: *See*—
Landi, Ernest D., 4,940,949, Cl. 330-262.000.

B.F. Goodrich Company, The: *See*—
Yang, Yung-Chin, 4,940,759, Cl. 526-62.000.

B & G Plastics, Inc.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,940,146, Cl. 211-13.000.

B. V. Asphalt- en Chemische Fabrieken Smid & Hollander: *See*—
Hollander, Jan, 4,940,501, Cl. 156-252.000.

Baba, Michio: *See*—
Ueda, Katsunobu; Sumiya, Mitsuo; and Baba, Michio, 4,940,319, Cl. 350-613.000.

Babcock, Martin P. Rope fastener. 4,939,820, Cl. 24-129.00R.

Babcock & Wilcox Company, The: *See*—
Bingham, Billy E.; and DeMars, Richard V., 4,941,158, Cl. 376-332.000.
Carter, Hudson R.; and Upperman, Eugene T., 4,939,921, Cl. 73-1.00R.

Bach, Volker; Sens, Ruediger; Etzbach, Karl-Heinz; and Ruske, Manfred, to BASF Aktiengesellschaft. Transfer of dyes. 4,940,692, Cl. 503-227.000.

Bachot, Jean: *See*—
Perineau, Jean-Maurice; and Bachot, Jean, 4,940,524, Cl. 204-242.000.

Backhus, Friedrich. Device for the mixing of compost. 4,940,338, Cl. 366-345.000.

Baginski, John R.: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Baillet, Alain; Loisel, Francois; and Paulin, Daniel, to Legrand. Wiring accessory dispenser. 4,940,163, Cl. 221-193.000.

Baillie, Lloyd A., to Atlantic Richfield Company. Method and apparatus to conduct fluidization of cohesive solids by pulsating vapor flow. 4,939,850, Cl. 34-10.000.

Bajaj, Ram: *See*—
Ammon, Robert L.; Buckman, Raymond W., Jr.; and Bajaj, Ram, 4,940,404, Cl. 419-28.000.

Bakalar, Jerome: *See*—
Rudd, Milo; and Bakalar, Jerome, 4,940,205, Cl. 249-63.000.

Baker Hughes, Inc.: *See*—
DiGregrio, David; Eismin, Richard J.; and Riser, Frederick M., 4,940,545, Cl. 210-609.000.
Gibbons, Gordon H., 4,940,394, Cl. 417-283.000.

Baker Manufacturing Company: *See*—
Lien, Neil C.; and Olsen, Donald G., 4,940,087, Cl. 166-88.000.

Baker, Raymond; Kneen, Clare O.; Saunders, John; and Swain, Christopher, to Merck Sharp & Dohme Limited. Spirocyclic compounds incorporating five-membered rings with two heteroatoms for treating psychotic disorders, etc. 4,940,703, Cl. 514-210.000.

Bakkum, Jacobus A.; and Rosenbrand, Gerrit G., to Shell Oil Company. Catalytic polymerization of carbon monoxide/olefin in the presence of insoluble particulate solid matter. 4,940,776, Cl. 528-392.000.

Baldinger, Verena: *See*—
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.

Ball, Martin F., to Metal Box Public Limited Company. Aerated liquid storage/dispensing apparatus. 4,940,169, Cl. 222-399.000.

Ballyns, Jan; Martin, John C.; and Martin, Paul H., to Diesel Equipment Limited. Load elevator platform for truck or the like. 4,940,380, Cl. 414-495.000.

Balzano, Quirino: *See*—
Nguyen, Tuan K.; and Balzano, Quirino, 4,940,992, Cl. 343-803.000.

Ban, Kaoru: *See*—
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, fumikazu; and Ohguchi, Masakatsu, 4,940,560, Cl. 264-211.000.

Bandeira, Nuno: *See*—
Gastouniotis, Constantine S.; Bandeira, Nuno; and Wilson, Kitchener C., 4,940,976, Cl. 340-870.020.

Baracat, Frederick A.; and Yaeger, Stanley A., Jr., to Motorola, Inc. Cable strain relief. 4,940,262, Cl. 285-114.000.

Barbour, William P. Automatic envelope opener and envelope for use therewith. 4,940,144, Cl. 206-610.000.

Barclay, Edward M.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,940,558, Cl. 264-46.700.

Barenwald, Jorg R.: *See*—
Van Duyn, Phillip L.; Barenwald, Jorg R.; and Kruse, Kenneth E., 4,940,359, Cl. 405-118.000.

Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., to Eli Lilly and Company. 7-substituted bicyclic pyrazolidinones, pharmaceutical compositions and use. 4,940,718, Cl. 514-370.000.

Barnett, Phillip R.: *See*—
Zimmerman, Richard J.; Barnett, Phillip R.; and Suter, Larry, 4,940,012, Cl. 118-301.000.

Barnsley, Michael F.; and Sloan, Alan D., to Iterated Systems, Inc. Methods and apparatus for image compression by iterated function system. 4,941,193, Cl. 382-56.000.

Baroid Technology, Inc.: *See*—
Bartel, Roger P.; and Rodney, Paul F., 4,940,943, Cl. 324-338.000.

Barrack Technology Limited: *See*—
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.

Bartel, Roger P.; and Rodney, Paul F., to Baroid Technology, Inc. Method and apparatus for optimizing the reception pattern of the

antenna of a propagating electromagnetic wave logging tool. 4,940,943, Cl. 324-338.000.

Barten, Axel: *See*—
Stahl, Werner; and Barten, Axel, 4,939,920, Cl. 72-237.000.

Bartlett, Robert R.: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,940,790, Cl. 544-8.000.

Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, to Iowa State University Research Foundation, Inc. Silylene- and disilyleneacetylene polymers from trichloroethylene. 4,940,767, Cl. 528-35.000.

Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, to J. Uriach & Cia, S.A. 2,4-disubstituted 1,3-dioxolanes and pharmaceutical use. 4,940,706, Cl. 514-231.500.

Bartuska, Victor J.; and Lewis, David H. Method and apparatus for conducting variable-temperature solid state magnetic resonance spectroscopy. 4,940,942, Cl. 324-321.000.

BASF Aktiengesellschaft: *See*—
Aldag, Reinhard; Neumann, Peter; Boetticher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.
Aumueller, Alexander; Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,940,742, Cl. 524-93.000.
Bach, Volker; Sens, Ruediger; Etzbach, Karl-Heinz; and Ruske, Manfred, 4,940,692, Cl. 503-227.000.
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.
Folda, Thomas; and Allspach, Thomas, 4,940,740, Cl. 523-428.000.
Kowarach, Heinrich; and Dix, Johannes P., 4,940,492, Cl. 106-494.000.
Kress, Gerhard, 4,940,735, Cl. 521-86.000.
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 4,940,650, Cl. 430-283.000.
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsamen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Weberndoerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, 4,940,514, Cl. 162-168.200.
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, 4,940,609, Cl. 427-304.000.
Weber, Heinz; Bleckmann, Gerhard; Dembek, Gerhard; Ehrmann, Gerd; Heinz, Gerhard; and Schlemmer, Lothar, 4,940,629, Cl. 428-213.000.

BASF Lacke & Farben Aktiengesellschaft: *See*—
Dickerhof, Karl-Heinz, 4,940,841, Cl. 524-510.000.

Bassman, Robert G., to Allied-Signal, Inc. Memory saving arrangement for displaying raster test patterns. 4,941,110, Cl. 364-521.000.

Bates, Thomas O., to Inco Alloys International, Inc. Welding flux and welding electrode. 4,940,882, Cl. 219-146.220.

Batts, Christine R.: *See*—
Batts, John W., III, 4,940,244, Cl. 273-403.000.

Batts, John W., III, to Batts, Christine R., a part interest. Archery target. 4,940,244, Cl. 273-403.000.

Bauder, Armin, to AUDI AG. Venting device for the fuel tank of a motor vehicle. 4,940,101, Cl. 180-69.400.

Bauer, Karl-Heinz, to Daimler-Benz AG. External door handle for a motor vehicle. 4,939,812, Cl. 16-110.00R.

Baughman, Richard C.; Fowlkes, William Y.; Rubin, Bruce J.; and Vreeland, William B., to Eastman Kodak Company. Transfer apparatus having vacuum holes for holding a receiving sheet. 4,941,020, Cl. 355-275.000.

Baum, Peter S. Tessellator. 4,940,309, Cl. 350-171.000.

Baurmeister, Ulrich, to Akzo NV. Multilayer hollow fiber wound body. 4,940,617, Cl. 428-36.300.

Baxter International Inc.: *See*—
Brown, Richard I.; Cerny, David E.; Foley, John T.; and West, Joseph C., Jr., 4,940,543, Cl. 210-369.000.

Bayer Aktiengesellschaft: *See*—
Boshagen, Horst; Junge, Bodo; Paessens, Arnold; and Schuller, Matthias, 4,940,705, Cl. 514-227.800.
Eichenauer, Herbert; Lindner, Christian; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,940,747, Cl. 524-504.000.
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.
Grape, Wolfgang; Schlak, Ottfried; de Montigny, Armand; and Kober, Hermann, 4,940,743, Cl. 524-377.000.
Kiel, Wolfgang; and Ziemann, Heinz, 4,940,819, Cl. 568-318.000.
Klug, Gunter; Buysch, Hans-Josef; and Puppe, Lothar, 4,940,817, Cl. 564-305.000.
Maurer, Fritz; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,940,698, Cl. 514-86.000.
Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, 4,940,755, Cl. 525-90.000.
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, 4,940,047, Cl. 128-90.000.
Rosthauser, James W.; and Meckel, Walter, 4,940,750, Cl. 524-871.000.

Beach, Wayne H.: *See*—
Stiffler, Stephen P.; and Beach, Wayne H., 4,940,288, Cl. 299-79.000.

Beall, George H.; Danielson, Paul S.; and Morena, Robert M., to Corning Incorporated. High strength, haze-free, transparent glass-ceramics. 4,940,674, Cl. 501-4.000.

Beall, George H.; and Quinn, Candace J., to Corning Incorporated. Zinc-containing phosphate glasses. 4,940,677, Cl. 501-45.000.

Beard, Paul R. Joining apparatus for cutting work pieces. 4,940,067, Cl. 144-2.00R.

Beasom, James D., to Harris Corporation. High voltage MOS structure. 4,941,027, Cl. 357-23.120.

Beaton, William I.; Taylor, James L.; Peck, Lawrence B.; and Mosby, James F., to Amoco Corporation. Catalytic cracking with deasphalted oil. 4,940,529, Cl. 208-61.000.

Beatty, Paul: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,939,887, Cl. 53-460.000.

Becerril-Ortega, Benito: *See*—
Martinez-Soto, Alfredo; Loredo-Murphy, Jorge; and Becerril-Ortega, Benito, 4,940,480, Cl. 65-356.000.

Beck, John A.: *See*—
Stern, Kenneth J.; and Beck, John A., 4,941,156, Cl. 375-118.000.

Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, to Akademie der Wissenschaften der DDR. Device for the investigation of highly resolved partial spectra of an echelle spectrum. 4,940,325, Cl. 356-328.000.

Beckrot, Anders W.: *See*—
Helling, James C.; Beckrot, Anders W.; and Murray, Scott V., 4,940,921, Cl. 315-219.000.

Becton Dickinson and Company: *See*—
Wagner, Daniel B.; and Vonk, Glenn P., 4,940,669, Cl. 436-501.000.
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,940,668, Cl. 436-174.000.

Bedorf, Norbert: *See*—
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.

Beecham Group p.l.c.: *See*—
Davis, Adrian F., 4,940,701, Cl. 514-179.000.
Finch, Stephen C.; and Pearson, Michael J., 4,940,702, Cl. 514-201.000.

Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, to Elba-Ordner-Fabrik Kraut & Meinenborn GmbH & Co. Device for storing data diskettes in file folders. 4,940,142, Cl. 206-444.000.

Behrenz, Wolfgang: *See*—
Maurer, Fritz; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,940,698, Cl. 514-86.000.

Beijing Research Institute of Chemical Industry: *See*—
Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, 4,940,687, Cl. 502-333.000.

Bell Communications Research, Inc.: *See*—
Abeles, Joseph H.; and Deri, Robert J., 4,940,303, Cl. 350-96.110.
Chuang, Justin C.; and Sollenberger, Nelson R., 4,941,155, Cl. 375-84.000.
Tabatabaie, Nader, 4,941,025, Cl. 357-16.000.

Bell & Howell Phillipsburg Company: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,939,887, Cl. 53-460.000.

Belyaev, Daniil I.: *See*—
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; Belyaev, Daniil I.; Bondaruk, Andrei V.; and Goronkov, Nikolai D., 4,940,876, Cl. 219-110.000.

Bemis Manufacturing Company, Inc.: *See*—
Pepper, Kenneth V., 4,939,796, Cl. 4-236.000.

Benczur-Urmossy, Gabor: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; and Berger, Gerhard, 4,940,553, Cl. 252-182.100.

Benham, Roger A. Cyclone solids separator and de-gasifier. 4,940,473, Cl. 55-205.000.

Bentley-Harris Manufacturing Company, The: *See*—
Moyer, James D., 4,939,819, Cl. 24-16.00R.

Benz & Hilgers GmbH: *See*—
Moller, Dieter; and Fischer, Georg, 4,940,172, Cl. 222-505.000.

Benzel, Martin: *See*—
Ohlmeyer, Manfred; and Benzel, Martin, 4,940,567, Cl. 422-173.000.

Beranek, Mark W.: *See*—
Schachameyer, Steven R.; and Beranek, Mark W., 4,940,505, Cl. 156-612.000.

Berdat, Henry F.: *See*—
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,940,641, Cl. 430-5.000.

Bergelin, Kurt: *See*—
Saalbach, Kurt; and Bergelin, Kurt, 4,939,901, Cl. 60-562.000.

Bergenstoff, Hans; and Otto, Torsten, to GN Davavox A/S. Method for the regulation of a hearing aid, a hearing aid and the use thereof. 4,941,179, Cl. 381-68.400.

Berger, Gerhard: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; and Berger, Gerhard, 4,940,553, Cl. 252-182.100.

Bergen, Hanns-Peter; Kriehn, Hartmut; Leier, Wolfgang; and Steffens, Ralf, to Leybold Aktiengesellschaft. Twin-shaft, multiple-stage vacuum pump with the shafts vertically disposed. 4,940,398, Cl. 417-410.000.

Bernardon, Jean-Michel: *See*—
Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, 4,940,696, Cl. 514-62.000.

Berner, John M. Position adjustable handrail for use along stairways. 4,939,876, Cl. 52-64.000.

Bernhardt, Christian A.: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Bertin & Cie: *See*—
Volat, Jean-Pierre, 4,940,219, Cl. 271-2.000.

Bertolini, Giorgio; Casagrande, Cesare; and Santangelo, Francesco, to Zambon Group S.p.A. Beazimidazole compounds active as inhibitors of the cholesterol biosynthesis. 4,940,800, Cl. 548-327.000.

Best, Jerry; Bourne, Richard C.; Hoeschele, Marc; and Bos, Willem, to Phenix Heat Pump Systems, Inc. Optimal control system for refrigeration-coupled thermal energy storage. 4,940,079, Cl. 165-2.000.

Betters, Melodie A.: *See*—
Scungio, Roger V.; and Betters, Melodie A., 4,939,913, Cl. 63-21.000.

Bezos, Angel P.; and Egerton, Gary W., to Pulse Electronics, Inc. Rapid release valve mechanism. 4,940,292, Cl. 303-81.000.

Bhowmik, Anup, to Rockwell International Corporation. Ring resonators with intracavity grazing incidence telescopes. 4,941,147, Cl. 372-94.000.

Biancalani, Mauro. Iron with a main assembly body and a heat separator. 4,939,857, Cl. 38-77.800.

Bibby, Max M. Apparatus for sizing produce and the like. 4,940,145, Cl. 209-662.000.

Bick, Peter A., to Pfizer Inc. Method of treating premature ejaculation using sertraline. 4,940,731, Cl. 514-657.000.

Biedinger, Jean-Marie: *See*—
Kant, Michel; Biedinger, Jean-Marie; Quessard, Roland; and Galko, Jacques, 4,940,912, Cl. 310-162.000.

Bien, Paul R., to General Motors Corporation. Railway traction motor with skewed support bearings. 4,940,002, Cl. 105-136.000.

Biervert, Klaus: *See*—
Bruder, Wolfgang; and Biervert, Klaus, 4,941,183, Cl. 382-8.000.

Bingham, Billy E.; and DeMars, Richard V., to Babcock & Wilcox Company, The. Nuclear reactivity control configuration. 4,941,158, Cl. 376-332.000.

Bioject, Inc.: *See*—
Casey, James P., I.; and Morrow, J. Thomas, 4,940,460, Cl. 604-143.000.

Biologix Inc.: *See*—
Littlejohn, Douglas J.; and Fellows, Richard L., 4,940,945, Cl. 324-438.000.

Birch, Christopher H., to Scientific-Atlanta, Inc. Method and apparatus for improving vertical definition of a television signal by scan conversion. 4,941,045, Cl. 358-140.000.

Bircumshaw, Peter, to W. E. McKenzie Limited. Cutting and the like tools. 4,939,965, Cl. 82-113.000.

Bird, John W., to Birow, Inc. Flexographic coating and/or printing method and apparatus including interstation driers. 4,939,992, Cl. 101-183.000.

Bird, Philip H., to U.S. Philips Corporation. An afc arrangement for tuning a television receiving apparatus to a select transmission having an actual carrier frequency which differs from a nominal carrrier frequency. 4,941,050, Cl. 358-195.100.

Birkmann, Rolf: *See*—
Waitl, Guenther; Birkmann, Rolf; and Schmidt, Ewald, 4,940,855, Cl. 174-52.500.

Birow, Inc.: *See*—
Bird, John W., 4,939,992, Cl. 101-183.000.

Bischoff, Dietmar: *See*—
Stober, Reinhard; Bischoff, Dietmar; and Huss, Michael, 4,940,785, Cl. 536-90.000.

Bishop, Frederick J.; Cooper, David T.; and Hill, William H., to Lucas Industries Public Limited Co. Ammunition chuting for a machine gun. 4,939,978, Cl. 89-33.140.

Bittle, Harley E., Jr. Arrow/wounded animal tracking device. 4,940,245, Cl. 273-416.000.

Black & Decker Inc.: *See*—
Czerner, Peter A., 4,939,856, Cl. 38-77.700.

Blair, James F. L.: *See*—
Aurand, Kenneth; and Blair, James F. L., 4,940,864, Cl. 200-342.000.

Blanc, Alain: *See*—
Abbiate, Jean-Claude; Blanc, Alain; Jeanniot, Patrick; and Lallemand, Eric, 4,941,151, Cl. 375-20.000.

Bleckmann, Gerhard: *See*—
Weber, Heinz; Bleckmann, Gerhard; Dembek, Gerhard; Ehrmann, Gerd; Heinz, Gerhard; and Schlemmer, Lothar, 4,940,629, Cl. 428-213.000.

Bleke, Jim: *See*—
Wyatt, W. Gerald; and Bleke, Jim, 4,939,988, Cl. 99-516.000.

Blentech Corporation: *See*—
Horn, Darrell C.; and Lennox, John M., III, 4,941,132, Cl. 366-278.000.

Blew, Douglas J., to Siecor Corporation. Method and apparatus for S-Z stranding. 4,939,896, Cl. 57-293.000.

Blin, Jean-Pierre: *See*—
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, 4,941,112, Cl. 364-527.000.

Bloom, William G.: *See*—
Gorton, Lanny A.; Pelmulder, John P.; Konopka, April A.; and Bloom, William G., 4,940,399, Cl. 417-415.000.

Bluemel, Thomas: *See*—
Aldag, Reinhard; Neumann, Peter; Boetticher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.

Blumenthal, Rafael, to Elscint Ltd. Method of manufacturing anatomical models. 4,940,412, Cl. 434-267.000.

Blunt, David H. Polyol-alkali metal silicate emulsion. 4,940,844, Cl. 521-116.000.

Bluzer, Nathan, to Westinghouse Electric Corp. High resistance optical shield for visible sensors. 4,941,029, Cl. 357-30.000.

Board of Regents, The University of Texas System: *See*—
Evans, James G., 4,940,676, Cl. 501-16.000.

Bock, Lawrence A.: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,940,732, Cl. 521-69.000.

Bock, Leonard, to Burndy Corporation. Electrical connector. 4,940,856, Cl. 174-94.00R.

Bocko, Peter L.; Crooker, David H.; and Echeverria, Lina M., to Corning Incorporated. Method for synthesizing topaz. 4,940,477, Cl. 65-18.200.

Boeing Company, The: *See*—
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,940,128, Cl. 198-395.000.
Houk, Theodore L.; and Falk, R. Aaron, 4,940,302, Cl. 350-96.120.
Thaniyavarn, Suwat, 4,940,305, Cl. 350-96.140.

Boetticher, Andreas: *See*—
Aldag, Reinhard; Neumann, Peter; Boetticher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.

Boettcher, Fritz P.; Dicker, Ira B.; Ebersole, Richard C.; and Hertler, Walter R., to Du Pont de Nemours, E. I., and Company. Group Transfer Polymerization process employing supported initiators. 4,940,760, Cl. 526-190.000.

Bogorsky, Mikhail V.: *See*—
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; Belyaev, Daniil I.; Bondaruk, Andrei V.; and Goronkov, Nikolai D., 4,940,876, Cl. 219-110.000.

Bohlayer, Julie A.; Foster, Gordon F.; and Shoup, Robert D., to Corning Incorporated. Method for making low-expansion glass article of complex shape. 4,940,675, Cl. 501-12.000.

Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, to Gesellschaft fur Biotechnologische Forschung mbH; and Ciba-Geigy Corporation. Microbicides. 4,940,804, Cl. 549-267.000.

Bohley, Thomas K.; Garnett, Grosvenor H.; Koerner, Christopher; and Moore, Charles E., to Hewlett-Packard Company. Combined rate/-width modulation arrangement. 4,940,979, Cl. 341-152.000.

Bohner, Beat; and Meyer, Willy, to Ciba-Geigy Corporation. Aminopyrazinones and aminotriazinones of the formula. 4,940,482, Cl. 71-92.000.

Bohner, Beat; Moser, Hans; and Pissiotas, Georg, to Ciba-Geigy Corporation. Herbicidal 3-methylphthalimides. 4,940,485, Cl. 71-96.000.

Bolton, Ronald R. Wedge shaped flashlight. 4,941,073, Cl. 362-80.100.

Bondaruk, Andrei V.: *See*—
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; Belyaev, Daniil I.; Bondaruk, Andrei V.; and Goronkov, Nikolai D., 4,940,876, Cl. 219-110.000.

Borden, Inc.: *See*—
Puleston, Sidney, 4,939,994, Cl. 101-348.000.

Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, to Commissariat a l'Energie Atomique. Electron source with micropoint emissive cathodes and display means by cathodoluminescence excited by field emission using said source. 4,940,916, Cl. 313-306.000.

Boren, Gary R. Rotary trenching machine. 4,939,854, Cl. 37-94.000.

Borgen, Arden L., to Margaret Platt Borgen. Product display and marketing device. 4,940,297, Cl. 312-138.100.

Borgens, Pauline B.: *See*—
Simpson, Howard D.; and Borgens, Pauline B., 4,940,533, Cl. 208-216.00R.

Boronat, Jean-Francois: *See*—
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,940,916, Cl. 313-306.000.

Bortnem, Mark A.: *See*—
Pailthorp, Robert M.; Goetz, Howard V.; Bortnem, Mark A.; and Edson, Bruce E., 4,941,082, Cl. 364-167.010.

Bos, Willem: *See*—
Best, Jerry; Bourne, Richard C.; Hoeschele, Marc; and Bos, Willem, 4,940,079, Cl. 165-2.000.

Boshagen, Horst; Junge, Bodo; Paessens, Arnold; and Schuller, Matthias, to Bayer Aktiengesellschaft. N-substituted derivatives of 1-desoxynojirimycin and 1-desoxymannonojirimycin and pharmaceutical use. 4,940,705, Cl. 514-227.800.

Bosna, Alexander A.; and Riccio, Louis M. Printed circuit board and method using thermal spray techniques. 4,940,623, Cl. 428-158.000.

Bothe, Lothar: *See*—
Dinter, Peter; Dallmann, Hermann; Bothe, Lothar; and Gribbin, John D., 4,940,521, Cl. 204-164.000.

Botre, Francesco; and Signorini, Roberto, to Ravizza S.p.a. Pharmacologically active piperazino derivatives. 4,940,793, Cl. 544-349.000.

Bouldin, David L.: *See*—
Tso, Stephen T.; Bouldin, David L.; Calley, Mark R.; and Tipton, Charlotte M., 4,940,509, Cl. 156-653.000.

Boule, Jean-Pierre; Hamel, Dominique; Hamel, Dominique; and Menconi, Martial. Device and method to render secure the transfer of data between a videotex terminal and a server. 4,941,173, Cl. 380-25.000.

Boulier, Paul R.: *See*—
Lo, Lawrence Y.; and Boulier, Paul R., 4,940,752, Cl. 525-67.000.

Bourne, Richard C.: *See*—
Best, Jerry; Bourne, Richard C.; Hoeschele, Marc; and Bos, Willem, 4,940,079, Cl. 165-2.000.

Bouttemy, Franck: *See*—
Hauton, Francois; Dumas, Frederic; Bouttemy, Franck; and Huc, Christian, 4,940,866, Cl. 219-10.55A.

Bowles, Thomas J. Visual fishing aid. 4,939,864, Cl. 43-17.000.

Boyce, Stephen T.; and Ham, Richard G., to University Patents, Inc. Process and defined medium for growth of human epidermal keratinocyte cells. 4,940,666, Cl. 435-240.200.

Boyne, Walter J., to Smithsonian Institution. Information storage and retrieval system. 4,941,125, Cl. 364-900.000.

BP Oil International Limited: *See*—
Lambert, Didier C., 4,940,900, Cl. 250-343.000.

Braat, Josephus J. M.: *See*—
Opheij, Willem G.; and Braat, Josephus J. M., 4,940,890, Cl. 250-216.000.

Braatz, James A.; Heifetz, Aaron H.; Wolfe, Richard A.; and Luthra, Narender P., to W. R. Grace & Co.-Conn. Chemically modified hydrophilic prepolymers and polymers. 4,940,737, Cl. 521-103.000.

Bradlee, Robert S.: *See*—
Dundics, Marton J.; and Bradlee, Robert S., 4,941,113, Cl. 364-551.010.

Bradley, Robert J. Golf putting practice ball and system. 4,940,238, Cl. 273-199.00R.

Bradt, Gordon E. Air-liquid kinetic sculpture apparatus. 4,939,859, Cl. 40-406.000.

Braese, Hans-Eberhard: *See*—
Eichenauer, Herbert; Lindner, Christian; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,940,747, Cl. 524-504.000.

Brailoff, Sam: *See*—
Rehberg, Thomas R.; and Brailoff, Sam, 4,940,407, Cl. 431-126.000.

Braley, Joseph M. Game to promote arithmetic skills. 4,940,240, Cl. 273-260.000.

Brandenburg, Ernest; and Chesnut, M. Gaines, to Ram-Line, Inc. Method and apparatus for orienting and loading cartridges. 4,939,862, Cl. 42-88.000.

Brandenstein, Manfred: *See*—
Kober, Jurgen; and Brandenstein, Manfred, 4,940,448, Cl. 474-111.000.

Brandes, Wilhelm: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lursaen, Klaus; and Froberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.

Brandt, Gerald B., to Westinghouse Electric Corp. Apparatus and method for increasing the efficiency of an acousto optic diffractive device. 4,940,316, Cl. 350-358.000.

Bravo, Janis E.; and Evans, David A., to DNA Plant Technology Corporation. Method of tomato protoplast fusion and regeneration of hybrid plants therefrom. 4,940,839, Cl. 800-220.000.

Brdicko, Jan: *See*—
Nyberg, Christopher A.; Jackson, James G.; and Brdicko, Jan, 4,941,134, Cl. 367-142.000.

Breault, Michelle S.; and Steinmetz, John H., to Pitney Bowes Inc. Mail management system transaction data customizing and screening. 4,941,091, Cl. 364-406.000.

Breitung, Edward J., II, to Stewart Warner Corporation. Programmable hour meter for recording elapsed operation time. 4,941,136, Cl. 368-8.000.

Brenner, Edeltraud. Elastic foot support to be built-in or inserted in shoes. 4,939,852, Cl. 36-44.000.

Brenner, Karl: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Breskin, Amos: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.

Brewer, Michael H.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.

Bridges, Steven D., to Phillips Petroleum Company. Purification of cis-olefins. 4,940,831, Cl. 585-836.000.

Bridgestone Corporation: *See*—
Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,940,914, Cl. 310-326.000.

Briggs & Stratton Corporation: *See*—
Gruenewald, Bryan E.; and Lokken, Clayton A., 4,939,916, Cl. 70-373.000.

Brischoux, Jean-Claude, to Salomon S.A. Safety binding. 4,940,253, Cl. 280-629.000.

British Aerospace PLC: *See*—
Adkins, Richard C., 4,940,392, Cl. 417-151.000.

British Aerospace Public Limited Company: *See*—
Putnam, Peter M. H., 4,940,197, Cl. 244-102.00R.

British Nuclear Fuels plc: *See*—
Emmison, John; and Cory, Anthony R., 4,940,899, Cl. 250-506.100.

British Petroleum Company p.l.c.: *See*—
Font Freide, Joseph J.; Howard, Mark J.; and Lomas, Trevor A., 4,940,826, Cl. 585-600.000.

Britt, Ronald H., to Lundy Electronics & Systems, Inc. Optical character reader with skew recognition. 4,941,189, Cl. 382-46.000.

Broberg, Daniel M., to Century Mfg. Co. Parts in place torch structure. 4,940,877, Cl. 219-121.500.

Brock, Lieselotte; Frank, Gunter; and Vitt, Bruno, to U.S. Philips Corporation. Optical interference filter. 4,940,636, Cl. 428-426.000.

Broekhuis, Antonius A.; Luijk, Pieter; and Stamhuis, Jan E., to Shell Oil Company. Elastomers and tires containing them. 4,940,756, Cl. 525-237.000.

Brokloff, John E.: *See*—
Jeyarajan, Arunachalam; Graham, Lawrence D.; Brokloff, John E.; and Monte, Louis H., 4,940,073, Cl. 164-361.000.

Brother Kogyo Kabushiki Kaisha: *See*—
Hara, Yoshimasa, 4,941,013, Cl. 355-20.000.
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, 4,940,643, Cl. 430-108.000.
Sakai, Jun, 4,940,688, Cl. 503-200.000.

Brown, Edward F.: *See*—
Miller, Joseph T.; and Brown, Edward F., 4,940,136, Cl. 206-38.100.

Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., to International Business Machines Corporation. Floating point normalization and rounding prediction circuit. 4,941,120, Cl. 364-748.000.

Brown, Lawrence M.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; and Lawrence, William H., to International Business Machines Corporation. Method for patterning cationic curable photoresist. 4,940,651, Cl. 430-325.000.

Brown, Michael F., to University of Virginia Alumni Patents Foundation. High-resolution spectral signature of human arterial plaque. 4,940,055, Cl. 128-653.00A.

Brown, Richard I.; Cerny, David E.; Foley, John T.; and West, Joseph C., Jr., to Baxter International Inc. Plasma collection set. 4,940,543, Cl. 210-369.000.

Brown, Robert J., Jr.; and Erturk, Bahattin, to Square D Company. Motor controlled switch mechanism. 4,940,903, Cl. 307-122.000.

Brown, Stephen A.; and Sleigh, Neville J. H., to Meco Mining Equipment Limited. Mine roof support assembly. 4,940,363, Cl. 405-296.000.

Bruder, Wolfgang; and Biervert, Klaus, to Durkopp System Technik GmbH. Method and apparatus for optimizing the cutting of material. 4,941,183, Cl. 382-8.000.

Brugger, Franz: *See*—
Burckhardt, Manfred; Faulhaber, Andreas; and Brugger, Franz, 4,940,293, Cl. 303-110.000.

Bruijn, Hendrik W.: *See*—
Janssen, Frank J.; Wilms, Coenraad H.; Reinalda, Donald; and Bruijn, Hendrik W., 4,940,827, Cl. 585-646.000.

Brunswick Corp.: *See*—
Garms, John F., 4,940,027, Cl. 123-73.0AD.
Kiesling, Douglas A., 4,940,434, Cl. 440-57.000.
McCormick, Daniel F., 4,940,402, Cl. 418-154.000.
Newman, Neil A., 4,940,436, Cl. 440-112.000.
Steffes, Thomas J., 4,940,271, Cl. 294-1.100.

Buchanan, Jeffery J., to Square D Company. Quick install and release fastening system. 4,940,355, Cl. 403-24.000.

Buchel, Karl H.: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lursaen, Klaus; and Froberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.

Buck, Alfred, to Buck, Alfred. Soot filter. 4,940,476, Cl. 55-486.000.

Buckholz, Lawrence L., Jr.: *See*—
Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sadol, Marion A., 4,940,592, Cl. 426-94.000.

Buckman, Raymond W., Jr.: *See*—
Ammon, Robert L.; Buckman, Raymond W., Jr.; and Bajaj, Ram, 4,940,404, Cl. 419-28.000.

Buell, V. Donald. Motorhome. 4,940,277, Cl. 296-164.000.

Buettner, Gerhard, to Siemens Aktiengesellschaft. Hearing aid with a contact spring configuration. 4,941,180, Cl. 381-69.200.

Buettner, Rudolf. Cutting tool. 4,940,039, Cl. 125-15.000.

Bugli, Neville J.: *See*—
Jaisinghani, Raian A.; and Bugli, Neville J., 4,940,470, Cl. 55-2.000.

Bull, John; Fettes, Ian; and Purcell, Harry. Aerobic conditioning apparatus. 4,940,233, Cl. 272-130.000.

Burckhardt, Manfred; Faulhaber, Andreas; and Brugger, Franz, to Daimler-Benz AG. Drive slip control device. 4,940,293, Cl. 303-110.000.

Burle Technologies, Inc.: *See*—
Smith, Edgar M., 4,940,967, Cl. 340-567.000.

Burndy Corporation: *See*—
Bock, Leonard, 4,940,856, Cl. 174-94.00R.

Burnet, George; and Gokhale, Ashok J., to Iowa State University Research Foundation, Inc. Hardened, environmentally disposable composite granules of coal cleaning refuse, coal combustion waste, and other wastes, and method preparing the same. 4,940,611, Cl. 428-2.000.

Burns, Gary R.: *See*—
Burns, William R.; Burns, Gary R.; and Burns, Paul W., 4,940,043, Cl. 128-75.000.
Burns, Paul W.: *See*—
Burns, William R.; Burns, Gary R.; and Burns, Paul W., 4,940,043, Cl. 128-75.000.
Burns, William R.; Burns, Gary R.; and Burns, Paul W., to Emergency Medical Products, Inc. Cervical collar of laminate construction. 4,940,043, Cl. 128-75.000.
Burr-Brown Corporation: *See*—
Naylor, Jimmy R.; Burt, Rodney T.; and Miller, Tony D., 4,940,981, Cl. 341-161.000.
Burroughs Wellcome Co.: *See*—
Kelley, James L., 4,940,713, Cl. 514-272.000.
Matthewson, Michael D., 4,940,729, Cl. 514-521.000.
Burt, Harold S.; and Difalco, Benjamin P., to Mid-West Conveyor Co., Inc. Integrated conveyor system with constant speed drive chain. 4,939,999, Cl. 104-88.000.
Burt, Rodney T.: *See*—
Naylor, Jimmy R.; Burt, Rodney T.; and Miller, Tony D., 4,940,981, Cl. 341-161.000.
Burt, Roy J. Method of etching in the presence of positive photoresist. 4,940,510, Cl. 156-656.000.
Burton, John W. Compact carbonated beverage making system. 4,940,212, Cl. 261-64.100.
Buschmann, Hans: *See*—
Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, 4,940,653, Cl. 430-502.000.
Bussac, Claude: *See*—
Meunier, Paul-Louis; Penot, Alain; Coutellier, Jean-Marc; and Bussac, Claude, 4,939,836, Cl. 29-603.000.
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Buszek, Frank J.: *See*—
Buszek, Daniel F.; and Buszek, Frank J., 4,940,311, Cl. 350-245.000.
Butka, Kemal. Safety razor. 4,939,840, Cl. 30-37.000.
Buynoski, Matthew S.: *See*—
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Buysch, Hans-Josef: *See*—
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Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sudol, Marion A., to International Flavors & Fragrances Inc. Process for microwave chocolate flavor formation in and/or on foodstuffs and products produced thereby. 4,940,592, Cl. 426-94.000.
Byrne, Thomas M., Jr.: *See*—
Amra, Lutfi H.; Byrne, Thomas M., Jr.; Martin, Harvey; Mordue, George S.; and Neff, David V., 4,940,384, Cl. 415-121.200.
C. A. Weidmueller GmbH & Co.: *See*—
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Cableshare, Inc.: *See*—
Pocock, Terrence H.; Coumans, Peter J. M.; McNorgan, Richard M.; and Hart, George M., 4,941,040, Cl. 358-86.000.
Cabot Corporation: *See*—
Fife, James A.; and Getz, Marlyn F., 4,940,490, Cl. 75-229.000.
Cadwell Industries, Inc.: *See*—
Cadwell, John A., 4,940,453, Cl. 600-13.000.
Cadwell, John A., to Cadwell Industries, Inc. Method and apparatus for magnetically stimulating neurons. 4,940,453, Cl. 600-13.000.
Caelli, Terrance M.: *See*—
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Sauvion, Guy-Noel; Caillod, Jack; and Gourlaouen, Claire, 4,940,685, Cl. 502-263.000.
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Camps, Ivo G. J.: *See*—
Ponjee, Johannes J.; Touwslager, Fredericus J.; and Camps, Ivo G. J., 4,940,673, Cl. 437-225.000.
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, to Rhone-Poulenc Chimie. 3-benzylidenecamphor-substituted diorganopolysiloxanes. 4,940,765, Cl. 528-15.000.
Canivenc, Edith: *See*—
Gay, Michel; and Canivenc, Edith, 4,940,766, Cl. 528-18.000.
Cannalte, Gary A.; Smith, Todd; Zancho, William F.; and Crawford, Robert J., to Motorola, Inc. Telephone system with customized central message center. 4,941,167, Cl. 379-67.000.
Canon Kabushiki Kaisha: *See*—
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Fujimoto, Ryo, 4,941,055, Cl. 358-340.000.
Honda, Takao; and Kobayashi, Yoshiaki, 4,941,019, Cl. 355-251.000.
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,940,999, Cl. 346-140.00R.
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.
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Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.
Sasaki, Takashi; and Udagawa, Yoshiro, 4,941,037, Cl. 358-80.000.
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Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,940,642, Cl. 430-65.000.
Takeda, Atsushi; Itoh, Masahiro; and Tsuchiya, Hiroaki, 4,941,003, Cl. 346-160.000.
Uchida, Takashi; Hoshino, Osamu; and Murayama, Yasushi, 4,941,021, Cl. 355-285.000.
Uehara, Tsukasa, 4,941,060, Cl. 360-99.050.
Wada, Toshihide; and Watanabe, Yuichi, 4,940,344, Cl. 400-144.200.
Yamada, Masanori, 4,941,188, Cl. 382-50.000.
Capawana, Ross. Machinegun ammunition container relationship to other applications. 4,939,979, Cl. 89-34.000.
Caputo, Anthony G.: *See*—
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Carborundum Company, The: *See*—
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Carceller, Elena: *See*—
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Cardoos, Nicholas, Jr.; Decker, Stephen; Norris, Philip R.; and Plummer, Lawrence, to Polaroid Corporation. Downloading film access door assembly for electronic imaging apparatus. 4,941,000, Cl. 346-145.000.
Carduck, Franz J.: *See*—
Schulz, Paul; Virnig, Michael J.; and Carduck, Franz J., 4,940,808, Cl. 549-436.000.
Carl Freudenberg, Firma: *See*—
Kilthau, Gerhard; Spies, Karl H.; Vogt, Rolf; Freilaender, Peter; and Seethaler, Toni, 4,940,248, Cl. 277-80.000.
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Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., to Chrysler Corporation. Method of determining the continuity of solenoids in an electronic automatic transmission system. 4,939,928, Cl. 73-118.100.
Carlisle, Billy M., Jr. Universal accumulator. 4,939,904, Cl. 62-77.000.
Carlton, Donna K.: *See*—
Sabblok, Jatinder P.; Horan, William J.; and Carlton, Donna K., 4,940,591, Cl. 426-94.000.
Carpenter, Robert M.: *See*—
Akers, Albert L.; Carpenter, Robert M.; Freeman, William D.; and Passafiume, John E., 4,940,348, Cl. 400-624.000.
Carra, Robert. Simulated skating exercising apparatus. 4,940,226, Cl. 272-70.000.
Carroll, Michael G.: *See*—
Smith, W. Novis, Jr.; and Carroll, Michael G., 4,940,619, Cl. 428-74.000.
Carter, Hudson R.; and Upperman, Eugene T., to Babcock & Wilcox Company, The. Method and system for one-line calibration and validation of process instrumentation. 4,939,921, Cl. 73-1.00R.
Cartwright, Edward V. Key control of important security keys. 4,939,917, Cl. 70-456.00R.
Casagrande, Cesare: *See*—
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Casey, James P., I.; and Morrow, J. Thomas, to Bioject, Inc. Patient-fillable and non-invasive hypodermic injection device assembly. 4,940,460, Cl. 604-143.000.
Casio Computer Co., Ltd.: *See*—
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Casper, Steven S.: *See*—
Callas, Anise M.; and Casper, Steven S., 4,940,159, Cl. 220-404.000.
Castelain, Yves; Jaubert, Philippe; and Peltier, Rene , to Aerospatiale Societe Nationale Industrielle. Autonomous moving body for transporting a tool at a constant speed. 4,940,382, Cl. 414-750.000.
Castillo, James D., to Innovation Sports, Inc. Knee brace incorporating adjustment means to accommodate anatomical variations of the knee joint and leg. 4,940,044, Cl. 128-80.00C.
Catto, Alberto: *See*—
Nardi, Dante; Leonardi, Amedeo; Catto, Alberto; and Graziani, Gabriele, 4,940,711, Cl. 514-255.000.
CD Medical, Inc.: *See*—
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Cedarapids, Inc.: *See*—
Musil, Joseph E., 4,940,334, Cl. 366-4.000.
Cei, Gustavo: *See*—
Mathias, Lon J.; and Cei, Gustavo, 4,940,796, Cl. 546-323.000.
Cellucci, Robert; MacKay, Duncan R.; and Madden, Allan C., to Coats Wheel Balancer Corp. Combined distance and diameter measuring apparatus for wheel balancing machine. 4,939,941, Cl. 73-865.800.
Cengel, John A.; and Pappas, Peter G., to Amoco Corporation. Passivation of polyamine dispersants toward fluorohydrocarbon compositions. 4,940,552, Cl. 252-51.50A.
Center for Innovative Technology: *See*—
Heck, Gerard L.; and DeSimone, John A., 4,940,056, Cl. 128-639.000.

Centre International de Recherches Dermatologiques (CIRD): *See*—
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Fisher, Marvin J., 4,940,927, Cl. 318-809.000.
Century Mfg. Co.: *See*—
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Cerberus AG: *See*—
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Challenger, Wendall R. Heating apparatus including ulta-violet portion. 4,940,885, Cl. 219-365.000.
Challis, Brian. Angular displacement measuring apparatus. 4,940,063, Cl. 128-774.000.
Chambers, Jeffrey; Armistead, Trevor; and Frodsham, John C., to Oxley Developments Company Limited. Removable filter array for multi-way connectors. 4,940,429, Cl. 439-608.000.
Chambers, Stephen H.: *See*—
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Chapdelaine, Albert H.; and Yatka, Robert J., to Wm. Wrigley Jr. Company. Use of aqueous thaumatin to enhance sweetness of chewing gum. 4,940,589, Cl. 426-3.000.
Checkrobot Inc.: *See*—
O'Connor, David F.; Dickover, Wesley; and Tilidetzke, Steven J., 4,940,116, Cl. 186-61.000.
Chen, Darco. Combination multipurpose frame structure. 4,940,232, Cl. 273-1.50R.
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., to Actel Corporation. Structure for protecting thin dielectrics during processing. 4,941,028, Cl. 357-23.130.
Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., to Alza Corporation. Skin permeation enhancer compositions using sucrose esters. 4,940,586, Cl. 424-464.000.
Cherish, Peter: *See*—
Petterson, William C.; Wells, Thomas A.; Cherish, Peter; and Morgan, Stephen W., 4,940,828, Cl. 585-652.000.
Chernack, Milton, to Chernack, Milton P. Pressure sensitive adhesive composition. 4,940,852, Cl. 523-211.000.
Chernack, Milton P.: *See*—
Chernack, Milton, 4,940,852, Cl. 523-211.000.
Chesnut, M. Gaines: *See*—
Brandenburg, Ernest; and Chesnut, M. Gaines, 4,939,862, Cl. 42-88.000.
Chesnut, Milton L.: *See*—
Ewing, Leonard G.; and Chesnut, Milton L., 4,939,908, Cl. 62-139.000.
Chezzi, Aleardo, to OTO MILLS S.p.A. Roll forming machine. 4,939,919, Cl. 72-181.000.
Chiang, Steve S.: *See*—
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., 4,941,028, Cl. 357-23.130.
Chiba, Seishi: *See*—
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.
Chida, Naomichi; and Watanabe, Akiyoshi, to Nakamichi Corporation. Method and an apparatus for measuring optical characteristics of an optical disk. 4,941,138, Cl. 369-44.410.
Chien, Jo-Lung: *See*—
Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, 4,940,687, Cl. 502-333.000.
Childers, Wayne E., Jr.; and Abou-Gharbia, Magid A., to American Home Products Corporation. 10,11-dihydro-5-alkyl-12-substituted-10,5-(iminomethano)-5H-dibenzo[a,d]cycloheptenes as neuroprotectant agents. 4,940,789, Cl. 540-581.000.
Childers, Winthrop D.; and Sperry, William, to Hewlett-Packard Company. Electrical make/break interconnect having high trace density. 4,940,413, Cl. 439-67.000.
Chinoin Gyogyszer es Vegyeszeti Termekek Gyara/Rt.: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.
Cho, Toohyon; and Shuler, Michael L., to Cornell Research Foundation, Inc. Use of inhibitory solvents in multi-membrane bioreactor. 4,940,547, Cl. 210-643.000.
Cholovich, George M. Trailer lock down device. 4,940,371, Cl. 410-101.000.
Christensen, Lars S.: *See*—
Hemmingsen, Hans; Christensen, Lars S.; and Monnike, Kristian B., 4,941,056, Cl. 358-497.000.
Chrysler Corporation: *See*—
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.
Chuang, Chiu-Kuang, to GTE Laboratories Incorporated. Speech recognition using preclassification and spectral normalization. 4,941,178, Cl. 381-41.000.
Chuang, Justin C.; and Sollenberger, Nelson R., to Bell Communications Research, Inc. Method and circuitry for symbol timing and frequency offset estimation in time division multiple access radio systems. 4,941,155, Cl. 375-84.000.
Chung, Samuel S.: *See*—
Rehkopf, Charles H.; Reigel, Franklin G.; and Chung, Samuel S., 4,940,440, Cl. 445-5.000.
Chung-Shan, Sheen. Faucet. 4,940,206, Cl. 251-52.000.
Ciba-Geigy Corporation: *See*—
Aebi, Rudolf; Hubele, Adolf; and Speich, Jurg, 4,940,799, Cl. 548-268.800.
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.
Bohner, Beat; and Meyer, Willy, 4,940,482, Cl. 71-92.000.
Bohner, Beat; Moser, Hans; and Pissiotas, Georg, 4,940,485, Cl. 71-96.000.
Eckhardt, Claude; and Hefti, Heinz, 4,940,555, Cl. 252-543.000.
Hubele, Adolf, 4,940,806, Cl. 549-365.000.
Mockel, Reinhart; and Putzar, Roland, 4,940,469, Cl. 8-527.000.
Muller, Urs; Tobler, Hans; Rempfler, Hermann; and Meyer, Alfred, 4,940,481, Cl. 71-76.000.
Nevill, David J.; and Steck, Bernhard, 4,940,720, Cl. 514-383.000.
Nevill, David J.; and Steck, Bernhard, 4,940,721, Cl. 514-383.000.
Peter, Heinrich, 4,940,811, Cl. 558-262.000.
Stingelin, Willy, 4,940,783, Cl. 534-605.000.
Topfl, Werner; Meyer, Willy; and Schneider, Hans-Dieter, 4,940,792, Cl. 544-321.000.
Wegmann, Alex; Tieke, Bernd; and Hilti, Bruno, 4,940,516, Cl. 204-14.100.
Citta, Richard W., to Zenith Electronics Corporation. Television system using reversing scan which minimizes ghost visibility. 4,941,049, Cl. 358-187.000.
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; and White, Danny R., to Lanxide Technology Company, LP. Process for preparing self-supporting bodies and products made thereby. 4,940,679, Cl. 501-96.000.
Claffey, Paul J. Anchor device. 4,939,877, Cl. 52-155.000.
Clark, Leslie J.: *See*—
Cowlin, Simon; Clark, Leslie J.; Dennis, Timothy J.; and Gunawardena, Charith A., 4,940,536, Cl. 209-592.000.
Clark, Robert E.; and Amos, Dennis R., to Westinghouse Electric Corp. Turbine system having more failure resistant rotors and repair welding of low alloy ferrous turbine components by controlled weld build-up. 4,940,390, Cl. 416-241.00R.
Clean-Pak, Inc.: *See*—
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., 4,940,621, Cl. 428-137.000.
Cleevely, Bruce T.: *See*—
Cote, James H.; Ekberg, Jurgen; Cleevely, Bruce T.; and George, Harry M., 4,940,156, Cl. 220-22.300.
Coats Wheel Balancer Corp.: *See*—
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Cobb, George: *See*—
Engler, Sid V.; and Cobb, George, 4,940,599, Cl. 426-524.000.
Coffer, Jerry W. Recycling bird feeder. 4,940,019, Cl. 119-522.000.
Coffey, Calvin T. Canoe paddling exercise machine. 4,940,227, Cl. 272-72.000.
Cohen, Gordon M.: *See*—
Spinelli, Harry J.; and Cohen, Gordon M., 4,940,761, Cl. 526-273.000.
Cohn, Arnold K. Epidural needle placement system. 4,940,458, Cl. 604-51.000.
Cohnen, Walther: *See*—
Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, 4,940,653, Cl. 430-502.000.
Colin, Claudine; and Wertz, Jean-Luc, to Societe Anonyme: Spontex. Cellular cellulosic wiping material. 4,940,631, Cl. 428-309.900.
Colle, Roberto; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, to Istituto Guido Donegani S.p.A. Azolyl-derivatives having fungicidal activity. 4,940,724, Cl. 514-397.000.
Colorado State University Research Foundation: *See*—
Mahan, John E., 4,940,898, Cl. 250-338.400.
Combs, Gary W.: *See*—
Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., 4,940,815, Cl. 564-18.000.
Commissariat a l'Energie Atomique: *See*—
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,940,916, Cl. 313-306.000.
Compagnie Europeenne de Composants Electroniques LCC: *See*—
Meunier, Paul-Louis; Penot, Alain; Coutellier, Jean-Marc; and Bussac, Claude, 4,939,836, Cl. 29-603.000.
Compagnis Europeenne de Composants Electroniques: *See*—
Coutellier, Jean-Marc; Jacobelli, Alain; Magna, Henriette; and Meunier, Paul-Louis, 4,939,835, Cl. 29-603.000.
Compaq Computer Corporation: *See*—
Grant, David L., 4,941,059, Cl. 360-72.200.
Compton, Roy C. Stack cap covering system. 4,939,874, Cl. 52-4.000.
Conopco, Inc. d/b/a/ Chesebrough-Pond's USA Co.: *See*—
Walsh, Michael F., 4,940,576, Cl. 424-70.000.
Consoli, John J.; and Hoffman, Norman E., to AMP Incorporated. Contact element for test socket for flat pack electronic packages. 4,940,432, Cl. 439-862.000.
Control Data Corporation: *See*—
Moline, Timothy W., 4,941,119, Cl. 364-745.000.
Cook, Thomas, to Hewlett-Packard Company. Detection of digital signal error rates. 4,941,161, Cl. 377-28.000.

Cooke, Michael T.: *See*—
Ley, David A.; Hiscock, Laura J.; and Cooke, Michael T., 4,940,734, Cl. 521-84.100.
Cookson Laminox Limited: *See*—
Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W., 4,940,572, Cl. 423-633.000.
Cooper, David T.: *See*—
Bishop, Frederick J.; Cooper, David T.; and Hill, William H., 4,939,978, Cl. 89-33.140.
Coors Porcelain Company: *See*—
Dinkha, Brian I.; Jasa, Paul B.; Seegmiller, Brian; and Simmons, Alden C., 4,939,996, Cl. 102-501.000.
CoreTank, Inc.: *See*—
Thomas, Horace F., 4,939,833, Cl. 29-401.000.
Corley, Edward G.; Larsen, Robert D.; Grabowski, Edward J. J.; and Reider, Paul, to Merck & Co., Inc. Resolution of a carboxylic acid. 4,940,813, Cl. 560-103.000.
Cornelius Company, The: *See*—
McMillin, John R., 4,940,165, Cl. 222-129.100.
Cornell Research Foundation, Inc.: *See*—
Cho, Toohyon; and Shuler, Michael L., 4,940,547, Cl. 210-643.000.
Corning Incorporated: *See*—
Aitken, Bruce G., 4,940,678, Cl. 501-73.000.
Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., 4,940,635, Cl. 428-408.000.
Beall, George H.; Danielson, Paul S.; and Morena, Robert M., 4,940,674, Cl. 501-4.000.
Beall, George H.; and Quinn, Candace J., 4,940,677, Cl. 501-45.000.
Bocko, Peter L.; Crooker, David H.; and Echeverria, Lina M., 4,940,477, Cl. 65-18.200.
Bohlayer, Julie A.; Foster, Gordon F.; and Shoup, Robert D., 4,940,675, Cl. 501-12.000.
Golino, Carlo M., 4,940,613, Cl. 428-34.700.
Corrado, Josephine. Magnetic key holder. 4,940,250, Cl. 206-37.100.
Cortese, Richard: *See*—
Theeuwes, Felix; Wong, Patrick S.-L.; Cortese, Richard; and Eckenhoff, James B., 4,940,465, Cl. 604-892.100.
Cory, Anthony R.: *See*—
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Cote, James H.; Ekberg, Jurgen; Cleevely, Bruce T.; and George, Harry M., to National Semiconductor Corporation. Thermoplastic multi-purpose tray with variable compartments. 4,940,156, Cl. 220-22.300.
Coumans, Peter J. M.: *See*—
Pocock, Terrence H.; Coumans, Peter J. M.; McNorgan, Richard M.; and Hart, George M., 4,941,040, Cl. 358-86.000.
Couper, John, to Unisys Corporation. Multiple document detector and separator. 4,940,224, Cl. 271-263.000.
Coutellier, Jean-Marc; Jacobelli, Alain; Magna, Henriette; and Meunier, Paul-Louis, to Compagnis Europeenne de Composants Electroniques. Method for achieving the planar surface of an active face for a magnetic recording/reading head. 4,939,835, Cl. 29-603.000.
Coutellier, Jean-Marc: *See*—
Meunier, Paul-Louis; Penot, Alain; Coutellier, Jean-Marc; and Busnac, Claude, 4,939,836, Cl. 29-603.000.
Coveney, Leila D.; Jones, Linda C.; and Maney, Jerry R., to Procter & Gamble Company, The. Bismuth-containing pharmaceutical compositions. 4,940,695, Cl. 514-57.000.
Cowlin, Simon; Clark, Leslie J.; Dennis, Timothy J.; and Gunawardena, Charith A., to Lockwood Graders (U.K.) Limited. Apparatus for inspecting and sorting articles. 4,940,536, Cl. 209-592.000.
Cox, Don C., to Otis Engineering Corporation. Slip assembly. 4,940,118, Cl. 188-67.000.
Craft, Scott, to Motorola Inc. Thermal shunt for electronic circuits. 4,941,067, Cl. 361-386.000.
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Cremonese, Henry V. Container. 4,940,189, Cl. 229-1.50B.
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Cromartie, Hendrick L. Knee guard and brace with adjustable medial condyle support pad. 4,940,045, Cl. 128-80.00C.
Crooker, David H.: *See*—
Bocko, Peter L.; Crooker, David H.; and Echeverria, Lina M., 4,940,477, Cl. 65-18.200.
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Cuba, Ronald R., Jr.; and Jenkins, Roland, to Uarco Incorporated. Display sticker for a vehicular window. 4,940,258, Cl. 283-81.000.
Culler, Scott R.; and Wakefield, David L., to Minnesota Mining and Manufacturing Company. Method of patching liners of large glass-lined reactors. 4,940,607, Cl. 427-140.000.
Cummings, Michael A., to Alusuisse-Lonza Services Ltd. Molten metal filtration system and process. 4,940,489, Cl. 75-407.000.
Cunningham, Ian M.; and Heaton, David W., to Imperial Chemical Industries PLC. Process for preparing azetidinones. 4,940,788, Cl. 540-200.000.
Curran, Thomas M. Isometric strength testing method and equipment for disability evaluation. 4,939,933, Cl. 73-379.000.
Curutchet, Jean L.; du Plessis, Michael P.; and Crane, Andre P., to AECI Limited. Detonator. 4,939,993, Cl. 102-202.140.
Czerner, Peter A., to Black & Decker Inc. Adjustable steam flow control for an electric steam iron. 4,939,856, Cl. 38-77.700.
Czukor, Janos: *See*—
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Dahlgren, Bo: *See*—
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Daimler-Benz AG: *See*—
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Burckhardt, Manfred; Faulhaber, Andreas; and Brugger, Franz, 4,940,293, Cl. 303-110.000.
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, 4,939,899, Cl. 60-412.000.
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Daly, Robert E.; Sloan, Clifford E.; and Sanidad, Armisticio Z., to Picker International, Inc. Flush for fluid mixing and dispensing system. 4,941,131, Cl. 366-167.000.
Dames, Robert G. Detoxification apparatus and method for toxic waste using laser energy and electrolysis. 4,940,519, Cl. 204-130.000.
Damiano, Louis; and Caputo, Anthony G. Adjustable guide assembly for stone masons and method of use thereof. 4,939,846, Cl. 33-404.000.
Dampier, Frederick W.; and Mank, Richard M., to Whittaker Technical Products, Inc. Electrode for electrochemical cell. 4,940,605, Cl. 427-77.000.
Dana Corporation: *See*—
Flotow, Richard A.; Sink, William H.; and Hermanns, Martin J., 4,940,126, Cl. 192-89.00B.
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Danielson, Paul S.: *See*—
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Danielsson, Sven E.: *See*—
Lindgren, Kent O.; Danielsson, Sven E.; Johnsson, Tommy M.; and Nilsson, Nils-Joel A., 4,940,503, Cl. 156-279.000.
Dao, Victor. Vehicle control and theft deterrent with remote transmitter. 4,940,964, Cl. 340-438.000.
Darnell, Michael J.; Hary, Joseph M.; and Quinn, Robert J., to International Business Machines Corporation. Two-step debugger for expert systems. 4,941,102, Cl. 364-513.000.
Data Management, Inc.: *See*—
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Databook, Inc.: *See*—
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Datapoint Corporation: *See*—
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David, Maurice J. A.: *See*—
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Davidson, Bruce L.: *See*—
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Davidson, James G., III; and Swierenga, Brian S., to Warner-Lambert Company. Substituted benzenemethanol compounds, intermediates thereof, and preparation thereof. 4,940,822, Cl. 568-812.000.
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Davies, Joseph R. Roller electrodes for electric-resistance welding machine. 4,940,873, Cl. 219-84.000.
Davis, Adrian F., to Beecham Group p.l.c. Topical drug release system. 4,940,701, Cl. 514-179.000.
Davis, Albert W. Torsion spring coupling. 4,940,357, Cl. 403-344.000.
Davis, Charles L., to Abbott Laboratories. Electronic data storage and retrieval apparatus and method. 4,941,201, Cl. 455-41.000.
Davis, Jackie L.: *See*—
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Davis, Mark F.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,941,177, Cl. 381-22.000.
Davis, Paul D.; Hillenbrand, Gary F.; and Adair, Paul C., to Mead Corporation, The. Imaging material employing photosensitive micro-

capsules containing tertiary amines as coinitiators. 4,940,645, Cl. 430-438.000.
Davot, Jean-Pierre P.: *See*—
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Deane, John D.; Ivie, Craig R.; and Schumacher, Percy W., to Reed Tool Company. Cutting elements for roller cutter drill bits. 4,940,099, Cl. 175-374.000.
Debe, Mark K., to Minnesota Mining and Manufacturing Company. Organic thin film controlled molecular epitaxy. 4,940,854, Cl. 428-411.100.
Debesis, John R., to Eastman Kodak Company. Laser beam stop. 4,940,308, Cl. 350-162.200.
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Degussa Aktiengesellschaft: *See*—
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Stober, Reinhard; Bischoff, Dietmar; and Huss, Michael, 4,940,785, Cl. 536-90.000.
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della Valle, Francesco; Romeo, Aurelio; and Lorenzi, Silvana, to Fidia, S.p.A. Therapeutic use of GM1 in severe cerebral ischemic strokes pathologies. 4,940,694, Cl. 514-25.000.
Delta Kogyo Co., Ltd.: *See*—
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DeLuca, Hector F.; Schnoes, Heinrich K.; and Lau, Wan F., to Wisconsin Alumni Research Foundation. Seco-sterol compounds effective in inducing cell differentiation. 4,940,700, Cl. 514-167.000.
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Demiryont, Hulya, to Ford Motor Company. Patterning of insulator on electrochromic material as determinant for area of coloration. 4,940,315, Cl. 350-357.000.
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Dentalwerk Burmoos Gesellschaft m.b.H.: *See*—
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Abeles, Joseph H.; and Deri, Robert J., 4,940,303, Cl. 350-96.110.
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Desautels, S. Jerry; and Kaiser, Timothy D., to Hazelett Strip-Casting Corporation. Method and apparatus for steering casting belts of continuous metal-casting machines. 4,940,076, Cl. 164-452.000.
DeSimone, John A.: *See*—
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Jones, Todd K.; Mills, Sander G.; and Desmond, Richard, 4,940,797, Cl. 548-110.000.
DesPortes, Aubrey S. Tire and process for making a tire. 4,940,445, Cl. 446-465.000.
De-Swaan, Avner, to F.I.A. Futurologie Industrielle Automation GmbH. Cutting head for use in a non-contact cutting process. 4,940,879, Cl. 219-121.670.
Detweiler, James P., to Honeywell Incorporated. Digitally controlled current source. 4,940,930, Cl. 323-273.000.
Deutsche Automobilgesellschaft: *See*—
von Benda, Klaus; Benczur-Urmossy, Gabor; and Berger, Gerhard, 4,940,553, Cl. 252-182.100.
De Wacker, Dennis R.; and Rosenberg, Leon, to National Starch and Chemical Investment Holding Corporation. Process for the production of hardboard. 4,940,741, Cl. 524-47.000.
Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., to Shell Oil Company. Bis-anthrols and bis-naphthols and diglycidyl ethers thereof. 4,940,809, Cl. 549-559.000.
de Wilde, Gerrit J. Bracket unit for fixing a roof gutter. 4,940,198, Cl. 248-48.100.
Dey, Michael J.: *See*—
MacFarlane, Calum B.; Selkirk, Alastair B.; and Dey, Michael J., 4,940,556, Cl. 264-15.000.
Diado Metal Company Ltd.: *See*—
Iizuka, Akihiro, 4,939,827, Cl. 29-898.054.
Diaz, Bonifacio, to Zenith Electronics Corporation. Start-up circuit for a high voltage DC to AC converter. 4,941,076, Cl. 363-49.000.
Dicker, Ira B.: *See*—
Boettcher, Fritz P.; Dicker, Ira B.; Ebersole, Richard C.; and Hertler, Walter R., 4,940,760, Cl. 526-190.000.
Dickerhof, Karl-Heinz, to BASF Lacke & Farben Aktiengesellschaft. Aqueous two-component paints for one-coating of high-resistant finishing sheeting and continuous edging. 4,940,841, Cl. 524-510.000.
Dickover, Wesley: *See*—
O'Connor, David F.; Dickover, Wesley; and Tilidetzke, Steven J., 4,940,116, Cl. 186-61.000.
Diehl, Donald R.; and Factor, Ronda E., to Eastman Kodak Company. Solid particle dispersion filter dyes for photographic compositions. 4,940,654, Cl. 430-522.000.
Dienst, Manfred, to Hermann Berstorff Maschinenbau GmbH. Degassing extruder. 4,940,329, Cl. 366-75.000.
Diesel Equipment Limited: *See*—
Ballyns, Jan; Martin, John C.; and Martin, Paul H., 4,940,380, Cl. 414-495.000.
Difalco, Benjamin P.: *See*—
Burt, Harold S.; and Difalco, Benjamin P., 4,939,999, Cl. 104-88.000.
Digele, Jorg, to Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG. Fluid friction clutch. 4,940,121, Cl. 192-58.00B.
Digital Appliance Controls, Inc.: *See*—
Sheahan, Thomas J., 4,941,160, Cl. 377-28.000.
Digital Equipment Corporation: *See*—
Gillett, Richard B., Jr.; and Williams, Douglas D., 4,941,083, Cl. 364-200.000.
Shaffer, Stephen J.; Warren, Richard A.; Eggers, Thomas W.; and Strecker, William D., 4,941,088, Cl. 364-200.000.
Shamouilian, Shamouil; and Ludwig, Paul N., 4,940,508, Cl. 156-643.000.
Zurawski, John H., 4,941,121, Cl. 364-757.000.
DiGregrio, David; Eismin, Richard J.; and Riser, Frederick M., to Baker Hughes, Inc. Aerobic waste sludge digester-thickener orbital system and method. 4,940,545, Cl. 210-609.000.
Dinkha, Brian I.; Jasa, Paul B.; Seegmiller, Brian; and Simmons, Alden C., to Coors Porcelain Company. Ceramic munitions projectile. 4,939,996, Cl. 102-501.000.
Dinter, Peter; Dallmann, Hermann; Bothe, Lothar; and Gribbin, John D., to Hoechst Aktiengesellschaft. Process and apparatus for pretreating the surface of a single-layer or multilayer molded material by means of an electrical corona discharge. 4,940,521, Cl. 204-164.000.
Director General of Fruit Tree Research Station Ministry of Agriculture, Forestry and Fisheries: *See*—
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.
Dirksing, Robert S.: *See*—
Iding, Stephen H.; and Dirksing, Robert S., 4,939,795, Cl. 4-228.000.
Ditacherlein, Friedhold, to Max Spaleck GmbH & Co. Centrifugal processing machine. 4,939,871, Cl. 51-163.200.
Dix, Johannes P.: *See*—
Kowarsch, Heinrich; and Dix, Johannes P., 4,940,492, Cl. 106-494.000.
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, 4,940,609, Cl. 427-304.000.
Dixon, Jerry L., Sr.: *See*—
Rademacher, Kevin A.; Dean, Dennis R.; Dixon, Jerry L., Sr.; and Szklarz, Robert J., 4,941,165, Cl. 379-1.000.
Długosz, Leonard T. Concrete construction units and multi-ply concrete composites made therefrom. 4,940,364, Cl. 405-229.000.
DNA Plant Technology Corporation: *See*—
Bravo, Janis E.; and Evans, David A., 4,940,839, Cl. 800-220.000.
Suslow, Trevor V.; and Jones, Jonathan D. G., 4,940,840, Cl. 800-205.000.
Doettling, Juergen: *See*—
Klingel, Hans; and Doettling, Juergen, 4,940,880, Cl. 219-121.670.
Dolby Laboratories Licensing Corporation: *See*—
Mandell, Douglas E., 4,940,977, Cl. 341-143.000.
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,941,177, Cl. 381-22.000.
Dolby, Timothy S. Recloseable box top lid. 4,940,191, Cl. 229-125.000.
Donahue, Patrick J.: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.

Donald, Robert J.: *See*—
Lensmire, Todd T.; Donald, Robert J.; Turley, Sheldon G.; and Tallmadge, Bruce J., 4,940,754, Cl. 525-80.000.
Donine, Michael T. Method and apparatus for supporting skis on a ski lift. 4,940,255, Cl. 280-809.000.
Doninger, Michael B. End finishing device for rope, wire, cable, and the like. 4,939,831, Cl. 29-263.000.
Donner, Joseph E.: *See*—
Hill, William H.; and Donner, Joseph E., 4,940,875, Cl. 219-89.000.
Dopheide, Dietrich; Faber, Michael; Taux, Guenter; and Reim, Gerhard, to Fed. Rep. of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute. Laser Doppler anemometer. 4,940,330, Cl. 356-28.500.
Dorbyl Light and General Engineering (Proprietary) Limited: *See*—
Somers Vine, John R., 4,940,261, Cl. 285-112.000.
Dormont Manufacturing Company: *See*—
Mayernik, Andrew B., 4,940,263, Cl. 285-342.000.
Dornier Medizintechnik GmbH: *See*—
Forsmann, Bernd; Hepp, Wolfgang; Heine, Geroid; Sell, Gustav; and Zech, Hendrik, 4,940,050, Cl. 128-24.00A.
Doty, Thomas J.: *See*—
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.
Dougakiuchi, Yasumasa: *See*—
Sakurai, Tsutomu; Hara, Yoshifumi; and Dougakiuchi, Yasumasa, 4,941,206, Cl. 455-607.000.
Dow Chemical Company, The: *See*—
Ezzell, Bobby R.; and Carl, William P., 4,940,525, Cl. 204-252.000.
Hay, Robert A., II; and Dowell, Albert C., 4,940,472, Cl. 55-195.000.
Lensmire, Todd T.; Donald, Robert J.; Turley, Sheldon G.; and Tallmadge, Bruce J., 4,940,754, Cl. 525-80.000.
Morris, Gregory J. E., 4,940,518, Cl. 204-128.000.
Pews, R. Garth; and Gall, James A., 4,940,821, Cl. 568-775.000.
Dowell, Albert C.: *See*—
Hay, Robert A., II; and Dowell, Albert C., 4,940,472, Cl. 55-195.000.
Dowell Schlumberger Incorporated: *See*—
Hilsman, Y. Gilbert, III, 4,940,093, Cl. 166-332.000.
Newman, Kenneth R., 4,940,095, Cl. 166-378.000.
Downing, John C. Light stimulator. 4,940,323, Cl. 351-203.000.
Drake, Charles A., to Phillips Petroleum Company. Hydrodemethylation of neohexane. 4,940,829, Cl. 585-752.000.
Drake, Charles A.; Parrish, William R.; and Lee, Roy C., to Phillips Petroleum Company. Olefin monomer separation process. 4,940,833, Cl. 585-868.000.
Drbal, Vladimir J. Clamp device with radially split head. 4,940,249, Cl. 279-41.00R.
Drebin, Kalman: *See*—
Waldman, Herbert H.; and Drebin, Kalman, 4,941,166, Cl. 379-67.000.
Drent, Eit, to Shell Oil Company. Polyketone from carbon monoxide/-monoethylenically unsaturated hydrocarbon/non-conjugated alkadiene. 4,940,775, Cl. 528-392.000.
Drent, Eit, to Shell Oil Company. Carbon monoxide/1,2-alkadiene copolymer. 4,940,777, Cl. 528-392.000.
Drent, Eit, to Shell Oil Company. Process for the carbonylation of acetylenic unsaturated compounds. 4,940,787, Cl. 536-124.000.
Drent, Eit: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.
Drexel University: *See*—
Wei, Yen, 4,940,517, Cl. 204-78.000.
Driesen, Manfred; Kurschatke, Wolfgang; and Kutz, Johannes, to Eduard Kusters Maschinenfabrik GmbH & Co KG. Jig. 4,939,914, Cl. 68-22.00R.
Dry Forming Processes AB: *See*—
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., 4,940,621, Cl. 428-137.000.
Dryga, Alexandr I.; and Eskov, Alexandr G. Unbalance vibrator. 4,940,336, Cl. 366-128.000.
Duerkop, Willi: *See*—
Heidotting, Werner; Scheffner, Wolfgang; and Duerkop, Willi, 4,940,428, Cl. 439-598.000.
Duff, Steven R., to Marion Laboratories, Inc. One-pot preparation of bismuth (phosph/sulf)ated saccharides. 4,940,786, Cl. 536-117.000.
Duffy, David K., to General Mills, Inc. Multicolored R-T-E cereal and method of preparation. 4,940,593, Cl. 426-94.000.
Dumas, Frederic: *See*—
Hauton, Francois; Dumas, Frederic; Bouttemy, Franck; and Huc, Christian, 4,940,866, Cl. 219-10.55A.
Dundics, Marion J.; and Bradlee, Robert S. Computer monitoring and testing of automatic control system. 4,941,113, Cl. 364-551.010.
Dunnett, Bruce: *See*—
Phillips, John A.; and Dunnett, Bruce, 4,940,983, Cl. 341-171.000.
Duplat, Gerard, to Robert Bosch GmbH. Fuel injection pump. 4,940,036, Cl. 123-506.000.
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Curutchet, Jean L.; du Plessis, Michael P.; and Crane, Andre P., 4,939,993, Cl. 102-202.140.
Du Pont de Nemours, E. I., and Company: *See*—
Boettcher, Fritz P.; Dicker, Ira B.; Ebersole, Richard C.; and Hertler, Walter R., 4,940,760, Cl. 526-190.000.
Gundlach, Kurt, 4,940,655, Cl. 430-523.000.
Hendren, Gary L.; and Hesler, Lee J., 4,940,512, Cl. 162-109.000.
Marcus, Ilan, 4,940,502, Cl. 156-272.200.
Spinelli, Harry J.; and Cohen, Gordon M., 4,940,761, Cl. 526-273.000.
Durham, Roger O. Sealed ball bearing mechanism. 4,940,340, Cl. 384-482.000.
Durkopp System Technik GmbH: *See*—
Bruder, Wolfgang; and Biervert, Klaus, 4,941,183, Cl. 382-8.000.
Durley, Benton A., III: *See*—
Kazlauskas, Vidas P.; Janczak, Roger A.; and Durley, Benton A., III, 4,940,527, Cl. 204-401.000.
E.G.O. Elektro-Gerate Blanc u. Fischer: *See*—
Kircherer, Robert; and Schreder, Felix, 4,940,886, Cl. 219-457.000.
E. R. Squibb & Sons, Inc.: *See*—
Steer, Peter L., 4,940,461, Cl. 604-333.000.
Ealey, Mark A.; and Salemme, Victor G., to Itek Corporation. Gradient membrane deformable mirror having replaceable actuators. 4,940,318, Cl. 350-611.000.
Eastman Kodak Company: *See*—
Baughman, Richard C.; Fowlkes, William Y.; Rubin, Bruce J.; and Vreeland, William B., 4,941,020, Cl. 355-275.000.
Debesis, John R., 4,940,308, Cl. 350-162.200.
Diehl, Donald R.; and Factor, Ronda E., 4,940,654, Cl. 430-522.000.
E'Errico, John R., 4,941,039, Cl. 358-80.000.
Johnson, Kevin M., 4,941,016, Cl. 355-202.000.
Lau, Philip T. S.; and Thompson, Danny R., 4,940,812, Cl. 560-12.000.
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tschang, Pin S.; and Zeise, Eric K., 4,941,004, Cl. 346-160.000.
Potucek, Martin, 4,941,001, Cl. 346-154.000.
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Eaton Corporation: *See*—
Preston, David M.; and Haefner, Donald R., 4,940,109, Cl. 180-197.000.
Schuchameyer, Steven R.; and Beranek, Mark W., 4,940,505, Cl. 156-612.000.
Ebara, Takeshi: *See*—
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Ebersole, Richard C.: *See*—
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Echelon Systems Corp.: *See*—
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Echeverria, Lina M.: *See*—
Bocko, Peter L.; Crooker, David H.; and Echeverria, Lina M., 4,940,477, Cl. 65-18.200.
Eckenhoff, James B.: *See*—
Theeuwes, Felix; Wong, Patrick S.-L.; Cortese, Richard; and Eckenhoff, James B., 4,940,465, Cl. 604-892.100.
Eckert, Konrad, to Robert Bosch GmbH. Fuel injection system for internal combustion engines. 4,940,037, Cl. 123-506.000.
Eckert, Robert J.: *See*—
Trovato, Stephen A.; Lefkowitz, Sheldon; and Eckert, Robert J., 4,940,289, Cl. 299-37.000.
Eckhardt, Claude; and Hefti, Heinz, to Ciba-Geigy Corporation. Storage-stable anionic liquid detergent compositions containing amphoteric distyryl derivative fluorescent whiteners. 4,940,555, Cl. 252-543.000.
Edelman, Paul F.; and Nulliner, Cynthia M., to Kcl Corporation. Tamper evident bag. 4,941,196, Cl. 383-5.000.
Edgar, Duane S.: *See*—
Kumar, Shalabh; and Edgar, Duane S., 4,941,081, Cl. 364-140.000.
Edling, Theodore L. Toy for cats. 4,940,018, Cl. 119-29.000.
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Eduard Kusters Maschinenfabrik GmbH & Co KG: *See*—
Driesen, Manfred; Kurschatke, Wolfgang; and Kutz, Johannes, 4,939,914, Cl. 68-22.00R.
E'Errico, John R., to Eastman Kodak Company. Color image reproduction apparatus having a least squares look-up table augmented by smoothing. 4,941,039, Cl. 358-80.000.
Effland, Richard C.; and Klein, Joseph T., to Hoechst-Roussel Pharmaceutical Inc. Pyrido[3,4-b][1,4]benzoxazepines. 4,940,704, Cl. 514-211.000.
Egerton, Gary W.: *See*—
Bezos, Angel P.; and Egerton, Gary W., 4,940,292, Cl. 303-81.000.
Eggers, Thomas W.: *See*—
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Ehler, David G. Ball receptor for basketball return machines and the like. 4,940,231, Cl. 273-1.50A.

Ehlert, Klaus-Peter: *See*—
Kubon, Achim; and Ehlert, Klaus-Peter, 4,940,075, Cl. 164-446.000.

Ehrman, Albert M.: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Ehrmann, Gerd: *See*—
Weber, Heinz; Bleckmann, Gerhard; Dembek, Gerhard; Ehrmann, Gerd; Heinz, Gerhard; and Schlemmer, Lothar, 4,940,629, Cl. 428-213.000.

Eichenauer, Herbert; Lindner, Christian; Ott, Karl-Heinz; and Braese, Hans-Eberhard, to Bayer Aktiengesellschaft. Moulding materials, based on vinyl chloride polymers, with improved processability. 4,940,747, Cl. 524-504.000.

Eigyo, Masami: *See*—
Takada, Susumu; Fujishita, Toshio; Sasatani, Takashi; Matsushita, Akira; and Eigyo, Masami, 4,940,714, Cl. 514-293.000.

Eisnin, Richard J.: *See*—
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Ekberg, Jurgen: *See*—
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Elan Corporation: *See*—
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Elba-Ordner-Fabrik Kraut & Meinenborn GmbH & Co.: *See*—
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,940,142, Cl. 206-444.000.

Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, to Bayer Aktiengesellschaft. Substituted azolylvinyl ketones and carbinols as fungicides and plant growth regulators. 4,940,798, Cl. 548-268.400.

Electricite de France (National Service): *See*—
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, 4,941,112, Cl. 364-527.000.

Electro Scientific Industries, Inc.: *See*—
Pailthorp, Robert M.; Goetz, Howard V.; Bortnem, Mark A.; and Edson, Bruce E., 4,941,082, Cl. 364-167.010.

Electrovac GES.M.B.H.: *See*—
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Eli Lilly and Company: *See*—
Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., 4,940,718, Cl. 514-370.000.

Elkem a/s: *See*—
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Ellers, Berne F.: *See*—
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., 4,940,621, Cl. 428-137.000.

Elms, Robert T.; Peterson, Clyde O.; and Saletta, Gary F., to Westinghouse Electric Corp. Compressor surge detection system. 4,940,391, Cl. 417-12.000.

Elscint Ltd.: *See*—
Blumenthal, Rafael, 4,940,412, Cl. 434-267.000.

Emergency Medical Products, Inc.: *See*—
Burns, William R.; Burns, Gary R.; and Burns, Paul W., 4,940,043, Cl. 128-75.000.

Emerging Technologies, Inc.: *See*—
Alexander, James R.; Johnson, Acie G.; and Prentice, Glenn W., 4,939,863, Cl. 42-103.000.

Emmison, John; and Cory, Anthony R., to British Nuclear Fuels plc. Transport and storage flask. 4,940,899, Cl. 250-506.100.

EMS-Togo AG: *See*—
Abend, Thomas; and Lauchenauer, Max, 4,940,748, Cl. 524-521.000.

Enck, Richard S., Jr.; Hindenes, Gregg A.; and Glasgow, Ian K., to Picker International, Inc. Support structure for vacuum tube components. 4,940,919, Cl. 313-526.000.

Enercon Industries Corporation: *See*—
Morters, Ronald W., 4,940,894, Cl. 250-324.000.

Enescu, Michael A.; and Lum, James, to International Business Machines Corporation. Tamper-resistant method for authorizing access to data between a host and a predetermined number of attached workstations. 4,941,175, Cl. 380-4.000.

Engel, Klaus-Eberhard: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.

Engel, Susanne: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.

Engler, Gideon: *See*—
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Engler, Sid V.; and Cobb, George. Method of producing fresh meat in which substantial moisture loss during production is reduced. 4,940,599, Cl. 426-524.000.

ERSA Sachs KG GmbH & Co.: *See*—
Hombrecher, Fritz, 4,940,178, Cl. 228-55.000.

Erturk, Bahattin: *See*—
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Eskofot A/S: *See*—
Hemmingsen, Hans; Christensen, Lars S.; and Monnike, Kristian B., 4,941,056, Cl. 358-497.000.

Eskov, Alexandr G.: *See*—
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Essilor International (Compagnie Generale d'Optique): *See*—
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Etcheverry, Tina M.; and Hitzeman, Ronald A., to Genentech, Inc. Metallothionein transcription control sequences and use thereof. 4,940,661, Cl. 435-69.100.

Ethyl Corporation: *See*—
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Etzbach, Karl-Heinz: *See*—
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Euroceltique, S.A.: *See*—
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Eustache, Jacques: *See*—
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Evans, David A.: *See*—
Bravo, Janis E.; and Evans, David A., 4,940,839, Cl. 800-220.000.

Evans, Donald: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,940,612, Cl. 428-34.200.

Evans, James G., to Board of Regents, The University of Texas System. Ceramic compositions and methods employing same. 4,940,676, Cl. 501-16.000.

Even, Ovadia: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.

EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H.: *See*—
Ritter, Gerhard; Ritter, Klaus; Scherr, Rudolf; and Jursche, Kurt, 4,940,874, Cl. 219-87.000.

Ewing, Daniel C.: *See*—
Herrick, Phillip R.; Ewing, Daniel C.; Wright, Floyd H.; and Truelove, Kevin M., 4,940,932, Cl. 324-158.0MG.

Ewing, Leonard G.; and Chesnut, Milton L. Apparatus for adjustably controlling the size of an ice bank. 4,939,908, Cl. 62-139.000.

Eyssautier, Bruno, to SANOFI, Societe Anonyme. Fermentation process for the production of xanthane. 4,940,663, Cl. 435-104.000.

Ezzell, Bobby R.; and Carl, William P., to Dow Chemical Company, The. Low equivalent weight sulfonic fluoropolymers. 4,940,525, Cl. 204-252.000.

F.I.A. Futurologie Industrielle Automation GmbH: *See*—
De-Swaan, Avner, 4,940,879, Cl. 219-121.670.

F.P.D. Future Patent Development Co., S.A.: *See*—
Popp-Ginsbach, Hildegard, 4,940,170, Cl. 222-402.100.

Faber, Michael: *See*—
Dopheide, Dietrich; Faber, Michael; Taux, Guenter; and Reim, Gerhard, 4,940,330, Cl. 356-28.500.

Fabianowski, Jan; and Ibach, Robert, to Asea Brown Boveri Aktiengesellschaft. Configuration for starting an inverter. 4,941,077, Cl. 363-49.000.

Factor, Ronda E.: *See*—
Diehl, Donald R.; and Factor, Ronda E., 4,940,654, Cl. 430-522.000.

Falberg, William H. Adjustable drum clamp. 4,939,972, Cl. 84-422.400.

Falckenberg, Richard: *See*—
Hoyler, Gerhard; Grabmaier, Josef; Falckenberg, Richard; and Freienstein, Bernhard, 4,940,568, Cl. 422-245.000.

Falk, R. Aaron: *See*—
Houk, Theodore L.; and Falk, R. Aaron, 4,940,302, Cl. 350-96.120.

Faraci, John A., Jr. Three player chess-type game. 4,940,241, Cl. 273-261.000.

Farbman, Jon. Marching shoe. 4,939,853, Cl. 36-103.000.

Farrar, David: *See*—
Flesher, Peter; Farrar, David; Hawe, Malcolm; and Langley, John, 4,940,763, Cl. 526-307.000.

Farrell, Christopher J.; Hlobil, Thomas; and Nahill, George F., to American National Can Company. Container and seam ring for container. 4,940,158, Cl. 220-258.000.

Farrington, David L., to Polaroid Corporation. Single integrator system with dual photocells. 4,941,011, Cl. 354-430.000.

Faulhaber, Andreas: *See*—
Burckhardt, Manfred; Faulhaber, Andreas; and Brugger, Franz, 4,940,293, Cl. 303-110.000.

Faville, Paul E.: *See*—
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,940,128, Cl. 198-395.000.

FCI, Inc.: *See*—
Peronek, Michael H.; and Jones, Robin C., 4,939,890, Cl. 53-486.000.

Fed. Rep. of Germany, represented by the Federal Minister for Economics, who is in turn represented by the President of the Physical-Technical Federal Institute: *See*—
Dopheide, Dietrich; Faber, Michael; Taux, Guenter; and Reim, Gerhard, 4,940,330, Cl. 356-28.500.

Feinberg, Arthur R., to United States of America, Navy. Integrator and firing circuit for proximity fuzes. 4,939,995, Cl. 102-214.000.
Feldmann, Hans-Ueli; and Heiz, Ueli, to JD-Technologie AG. Positioning device for positioning a load carrying platform relative to a docking station. 4,940,378, Cl. 414-401.000.
Fell, Peter J.: *See*—
Wood, Philip S.; and Fell, Peter J., 4,940,566, Cl. 420-443.000.
Fellows, Richard L.: *See*—
Littlejohn, Douglas J.; and Fellows, Richard L., 4,940,945, Cl. 324-438.000.
Fergin, Richard L.: *See*—
Zinnen, Hermann A.; and Fergin, Richard L., 4,940,830, Cl. 585-828.000.
Ferguson, Fred S.; and Perry, Lonnie K. Well clean out tool. 4,940,092, Cl. 166-311.000.
Fett, Michael E. Infant fluid drinking container. 4,940,151, Cl. 215-11.100.
Fettes, Ian: *See*—
Bull, John; Fettes, Ian; and Purcell, Harry, 4,940,233, Cl. 272-130.000.
Feuvrier, Thierry; and Forestier, Alexandre, to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A.". Multiple flow turbojet engine with an outer ring of the fan outlet shrunk onto the case. 4,940,386, Cl. 415-209.200.
Fidia, S.p.A.: *See*—
della Valle, Francesco; Romeo, Aurelio; and Lorenzi, Silvana, 4,940,694, Cl. 514-25.000.
Fife, James A.; and Getz, Marlyn F., to Cabot Corporation. Tantalum powder. 4,940,490, Cl. 75-229.000.
Fikentscher, Rolf: *See*—
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, 4,940,609, Cl. 427-304.000.
Filip, Octavian, to Mero-Raumstruktur GmbH & Co. Prefabricated pyramid-shaped structural members for three-dimensional frameworks. 4,939,882, Cl. 52-648.000.
Fillmore, William E.; and Fuchs, Timothy J., to Owens-Illinois Closure Inc. Child resistant dispensing closure. 4,940,167, Cl. 222-153.000.
Finch, Stephen C.; and Pearson, Michael J., to Beecham Group p.l.c. Cephem compounds. 4,940,702, Cl. 514-201.000.
Finke, Manfred: *See*—
Honel, Michael; Finke, Manfred; Walz, Gerd; and Ziegler, Peter, 4,940,768, Cl. 528-45.000.
Finnegan, John J.: *See*—
Shappirio, Joel R.; Aucoin, Thomas R.; and Finnegan, John J., 4,940,693, Cl. 505-1.000.
Fiorentino, Frank S.; and Patton, Douglas M., to McKesson Corporation. Eye wash station. 4,939,800, Cl. 4-620.000.
Fischer, Artur, to fischerwerke Artur Fischer GmbH & Co. KG. Anchoring plug. 4,940,372, Cl. 411-32.000.
Fischer, Georg: *See*—
Moller, Dieter; and Fischer, Georg, 4,940,172, Cl. 222-505.000.
Fischer, Manfred: *See*—
Speiser, Josef; and Fischer, Manfred, 4,940,400, Cl. 418-61.200.
Fischer, Michael A., to Datapoint Corporation. Input/output network for computer system. 4,941,089, Cl. 364-200.000.
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, to BASF Aktiengesellschaft. Preparation of 1,4-butanediol or tetrahydrofuran or both. 4,940,805, Cl. 549-326.000.
Fischer, Wolfgang: *See*—
Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Pieter, Reimund, 4,940,784, Cl. 536-1.100.
fischerwerke Artur Fischer GmbH & Co. KG: *See*—
Fischer, Artur, 4,940,372, Cl. 411-32.000.
Fish, Robert D. Levered fluid drain valve. 4,940,209, Cl. 251-144.000.
Fisher, David W.; and Frishkorn, Eric T., to AMP Incorporated. Optical discontinuity monitor system. 4,940,892, Cl. 250-227.240.
Fisher, Martin A. Internal combustion engine with balancing forces. 4,940,026, Cl. 123-53.00R.
Fisher, Marvin J., to Century Electric, Inc. Three-phase A-C speed control for variable torque motor. 4,940,927, Cl. 318-809.000.
Fisher, William F.; and Young, Grant A., to Amoco Corporation. Solids flow distribution apparatus. 4,940,535, Cl. 209-250.000.
Fitzpatrick, Leo F.: *See*—
Su, Sophia R.; Fitzpatrick, Leo F.; and Robillard, Sheryl A., 4,940,571, Cl. 423-339.000.
Flanigen, Edith M.; Lok, Brent M.; Patton, Robert L.; and Wilson, Stephen T., to UOP. Beryllium-aluminum-phosphorus-oxide molecular sieve compositions. 4,940,570, Cl. 423-306.000.
Fleet, Vern V.: *See*—
Grillo, John M.; Hilby, James A.; Fleet, Vern V.; Gardella, Cameron G.; and Hill, Gary J., 4,940,936, Cl. 324-174.000.
Flesher, Peter; Farrar, David; Hawe, Malcolm; and Langley, John, to Allied Colloids Limited. Water soluble polymers. 4,940,763, Cl. 526-307.000.
Fletcher, Graham J.: *See*—
Laws, Peter G.; and Fletcher, Graham J., 4,940,948, Cl. 329-307.000.
Fletcher-Jones, David F., to AE PLC. Investment-cast piston crown cap with encapsulated non-metallic insulating core. 4,939,984, Cl. 92-176.000.
Florek, Stefan: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.
Flori, Luigi: *See*—
Danenberg, Bernard; and Flori, Luigi, 4,941,069, Cl. 361-419.000.
Flotow, Richard A.; Sink, William H.; and Hermanns, Martin J., to Dana Corporation. Diaphragm spring clutch. 4,940,126, Cl. 192-89.00B.
Folda, Thomas; and Allspach, Thomas, to BASF Aktiengesellschaft. Single phase toughened heat-curable resin systems exhibiting high strength after impact. 4,940,740, Cl. 523-428.000.
Foley, John T.: *See*—
Brown, Richard I.; Cerny, David E.; Foley, John T.; and West, Joseph C., Jr., 4,940,543, Cl. 210-369.000.
Font Freide, Joseph J.; Howard, Mark J.; and Lomas, Trevor A., to British Petroleum Company p.l.c. Process for the production of mono-olefins by the catalytic oxidative dehydrogenation of gaseous paraffinic hydrocarbons having two or more carbon atoms. 4,940,826, Cl. 585-600.000.
Fontana, Robert E., Jr.; Howard, James K.; Lee, James H.; and Lefakis, Haralambos, to International Business Machines Corporation. Method for making a magnetoresistive read transducer. 4,940,511, Cl. 156-656.000.
Foran, Laverne E.: *See*—
Mechalas, Emmanuel; and Foran, Laverne E., 4,940,902, Cl. 250-573.000.
Ford Motor Company: *See*—
Demiryont, Hulya, 4,940,315, Cl. 350-357.000.
Laude, David P., 4,940,907, Cl. 307-359.000.
Munie, Richard T., 4,940,420, Cl. 439-272.000.
Forestier, Alexandre: *See*—
Feuvrier, Thierry; and Forestier, Alexandre, 4,940,386, Cl. 415-209.200.
Forestier, Serge: *See*—
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 4,940,765, Cl. 528-15.000.
Forish, John A.; and Rogers, John J., to Zaxxx, Inc. Low profile lamp socket assembly. 4,940,422, Cl. 439-356.000.
Forssmann, Bernd; Hepp, Wolfgang; Heine, Gerold; Sell, Gustav; and Zech, Hendrik, to Dornier Medizintechnik GmbH. Device for ensuring the proper positioning of electrodes in a lithotripter. 4,940,050, Cl. 128-24.00A.
Forster, Martin; and Illert, Claudia, to Cerberus AG. Novel pyroelectric detector. 4,940,897, Cl. 250-338.300.
Foster, David, to Lucas Industries Public Limited Company. Hydraulic anti-lock braking systems for vehicles. 4,940,294, Cl. 303-115.000.
Foster, Edwin E. Two-legged baby swing. 4,940,229, Cl. 272-86.000.
Foster, Gordon F.: *See*—
Bohlayer, Julie A.; Foster, Gordon F.; and Shoup, Robert D., 4,940,675, Cl. 501-12.000.
Foster, Raymond K. Seals for reciprocating conveyor floor members. 4,940,132, Cl. 198-750.000.
Fowlkes, William Y.: *See*—
Baughman, Richard C.; Fowlkes, William Y.; Rubin, Bruce J.; and Vreeland, William B., 4,941,020, Cl. 355-275.000.
Fox, Charles E.: *See*—
Neidiffer, Fred; Fox, Charles E.; and Fox, Patsy E., 4,940,493, Cl. 134-3.000.
Fox, David A.; and Jessee, Ralph D., to Westinghouse Electric Corp. Timing correction for square wave inverter power poles. 4,941,075, Cl. 363-41.000.
Fox, Patsy E.: *See*—
Neidiffer, Fred; Fox, Charles E.; and Fox, Patsy E., 4,940,493, Cl. 134-3.000.
Fox Valley Systems, Inc.: *See*—
Smrt, Thomas J., 4,940,184, Cl. 239-71.000.
Fraley, Robert T.: *See*—
Shah, Dilip M.; Rogers, Stephen G.; Horsch, Robert B.; and Fraley, Robert T., 4,940,835, Cl. 800-205.000.
Fran Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H.: *See*—
Theurer, Josef, 4,939,998, Cl. 104-12.000.
Frances, Jean-Marc; and Wajs, Georges, to Essilor International (Compagnie Generale d'Optique). Wettable silicon elastomer for the manufacture of contact lenses. 4,940,751, Cl. 525-54.200.
Frank, George J., Jr. Drop wire clamp assembly. 4,939,821, Cl. 24-136.00R.
Frank, Gunter: *See*—
Brock, Lieselotte; Frank, Gunter; and Vitt, Bruno, 4,940,636, Cl. 428-426.000.
Franke, Joachim: *See*—
Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, 4,940,755, Cl. 525-90.000.
Franz, Lothar: *See*—
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Frappier, Gerard: *See*—
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Frederick, Philip R. Automatic horizontal and vertical scanning radar. 4,940,987, Cl. 342-26.000.
Freeman, William D.: *See*—
Akers, Albert L.; Carpenter, Robert M.; Freeman, William D.; and Passafiume, John E., 4,940,348, Cl. 400-624.000.

Freeriksen, Donald L.: *See*—
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Freienstein, Bernhard: *See*—
Hoyler, Gerhard; Grabmaier, Josef; Falckenberg, Richard; and Freienstein, Bernhard, 4,940,568, Cl. 422-245.000.
Freilaender, Peter: *See*—
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Frenkel, Larisa R.: *See*—
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Frischling, Louis A.: *See*—
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Frishkorn, Eric T.: *See*—
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Friskney, Stephen H.: *See*—
Jackson, James R.; and Friskney, Stephen H., 4,940,298, Cl. 312-228.000.
Fritsch, Joseph F., to Ryan Plastics Ireland Limited. Apparatus for cleaning a video player/recorder. 4,941,065, Cl. 360-128.000.
Fritz, Kenneth E. Method for forming a polymeric mold. 4,940,561, Cl. 264-225.000.
Fritzsche, Harold L., to General Electric Company. Core for a dynamoelectric machine. 4,940,913, Cl. 310-216.000.
Frodsham, John C.: *See*—
Chambers, Jeffrey; Armistead, Trevor; and Frodsham, John C., 4,940,429, Cl. 439-608.000.
Frohberger, Paul-Ernst: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.
Frommeld, Hans-Dieter; and Wiezer, Hartmut, to Hoechst Aktiengesellschaft. Photopolymerizable compositions a leuco dye and a leuco dye stabilizer. 4,940,647, Cl. 430-271.000.
Fruehauf Corporation: *See*—
Abott, Richard A.; Ringe, Stephen J.; and Keeler, Michael J., 4,940,279, Cl. 296-181.000.
Fu, Hsueh-Chin. Safety exhaust valve equipped spray gun. 4,940,185, Cl. 239-126.000.
Fuchizawa, Tetsuro: *See*—
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Fuchs, Timothy J.: *See*—
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Fuji Jukogyo Kabushiki Kaisha: *See*—
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Fuji Oil Company, Limited: *See*—
Yokoyama, Hitoshi; Sano, Hiroyuki; Horimoto, Akiko; and Kizaki, Masatoshi, 4,940,600, Cl. 426-582.000.
Fuji Photo Film Co., Ltd.: *See*—
Hatori, Masami, 4,940,304, Cl. 350-96.130.
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.
Nakamura, Takashi, 4,941,008, Cl. 354-320.000.
Sato, Yoshimitsu, 4,940,993, Cl. 346-76.0PH.
Shimura, Kazuo, 4,941,194, Cl. 382-56.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, 4,940,656, Cl. 430-538.000.
Fuji Photo Filom Co., Ltd.: *See*—
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Fujieda, Fusao, to Mazda Motor Corporation. Slip control system for torque converter of automatic transmission. 4,940,122, Cl. 192-3.310.
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Fujii, Syuso: *See*—
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Fujii, Takayuki: *See*—
Nogami, Yoshio; Matsuo, Yoshihiro; Fujii, Takayuki; and Urashi, Seiichi, 4,940,111, Cl. 180-219.000.
Fujimoto, Hiroaki, to Sanshin Kogyo Kabushiki Kaisha. Fuel boosting system for internal combustion engine. 4,940,032, Cl. 123-424.000.
Fujimoto, Ryo, to Canon Kabushiki Kaisha. Recording apparatus with improved S/N ratio. 4,941,055, Cl. 358-340.000.
Fujimura, Shoji; and Kawai, Toru, to Shikibo Ltd. Master pattern for upper garments. 4,939,844, Cl. 33-12.000.
Fujioka, Yasushi: *See*—
Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,940,642, Cl. 430-65.000.
Fujisaku, Kiminori, to Fujitsu Limited. CRT display device with a picture-shifting circuit. 4,940,970, Cl. 340-726.000.
Fujisawa Pharmaceutical Co., Ltd.: *See*—
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Fujisawa, Yasuhiro: *See*—
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Fujishita, Toshio: *See*—
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Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, to Kabushiki Kaisha Toshiba. Vacuum interrupter contacts and process for producing the same. 4,940,863, Cl. 200-144.00B.
Fujita, Kazuo. Folding stage system. 4,939,875, Cl. 52-7.000.
Fujitani, Mitsuhiro; Oka, Hiroyuki; and Hirano, Seiji, to Sumitomo Wiring Systems, Ltd. Electrical connector with openable cover. 4,940,430, Cl. 439-686.000.
Fujitsu Limited: *See*—
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Fujiwara, Hideo: *See*—
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Fujiwara, Michiaki, to Murata Kikai Kabushiki Kaisha. Spinning apparatus. 4,939,893, Cl. 57-22.000.
Fukahori, Osamu: *See*—
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Fukao, Kaname: *See*—
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Fukatsu, Yasuhiro: *See*—
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Youji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, 4,939,867, Cl. 49-349.000.
Fukuda, Yoshio: *See*—
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Fukuyama, Yukihiro: *See*—
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Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., to Boeing Company, The. Article orientation system and method. 4,940,128, Cl. 198-395.000.
Fullmer, David J.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.
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Furlan, Piero: *See*—
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Furukawa Electric Co., Ltd., The: *See*—
Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, 4,940,851, Cl. 501-56.000.
Furumoto, Mitsumasa; Kawahara, Eiichiro; Ikejiri, Kenichi; and Yamamoto, Noboru, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulically operated continuously variable transmission. 4,939,900, Cl. 60-456.000.
Futamura, Shoji, to Institute of Technology Precision Electrical Discharge Works. Electric discharge machining circuit. 4,940,872, Cl. 219-69.130.
Futura Coatings, Inc.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,940,558, Cl. 264-46.700.
G. D. Searle & Co.: *See*—
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Gaiser, John W.: *See*—
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Gale, Robert M.: *See*—
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Galko, Jacques: *See*—
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Gall, James A.: *See*—
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Gallagher, Roy L. Locking bolts for vehicle exhaust manifold pipes. 4,940,374, Cl. 411-120.000.
Galuska, Raymond D.; and Murawski, Charles S., to Komatsu Dresser Company. Spring clip for preventing clutch plate flutter. 4,940,124, Cl. 192-70.280.
Garavaglia, Carlo: *See*—
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Gardella, Cameron G.: *See*—
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Garms, John F., to Brunswick Corp. Marine engine with water cooled fuel line from remote tank. 4,940,027, Cl. 123-73.0AD.
Garner, William J., to International Mobile Machines Corporation. Band-pass filter and support structure therefor. 4,940,956, Cl. 333-209.000.
Garnett, Grosvenor H.: *See*—
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Garrett, Michael K.: *See*—
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Gartner, Maria: *See*—
Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, 4,940,755, Cl. 525-90.000.
Gas Research Institute: *See*—
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Gastouniotis, Constantine S.; Bandeira, Nuno; and Wilson, Kitchener C., to Utilicom Inc. Automated remote water meter readout system. 4,940,976, Cl. 340-870.020.
Gateway Industries, Inc.: *See*—
Grabowski, Richard M., 4,940,193, Cl. 242-107.300.
Gatta, Raymond P. Compliant positioning system for operating on assembly line products. 4,939,838, Cl. 29-795.000.
Gay, Michel; and Canivenc, Edith, to Rhone-Poulenc Chimie. Acrylate and/or methacrylate-substituted organopolysiloxanes. 4,940,766, Cl. 528-18.000.
Gay, Michel: *See*—
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 4,940,765, Cl. 528-15.000.
Gebert, Ulrich: *See*—
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Geftec S.A.: *See*—
Posso, Patrick, 4,940,140, Cl. 206-405.000.
Geiger, Margaret W., to Hoechst Celanese Corporation. Increased sensitivity photoinitiation compositions. 4,940,648, Cl. 430-272.000.
Gelardi, Anthony L.: *See*—
Swinburne, Stephen G.; Gelardi, Anthony L.; and Stiles, William, 4,941,066, Cl. 360-133.000.
Gelorme, Jeffrey D.: *See*—
Brown, Lawrence M.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; and Lawrence, William H., 4,940,651, Cl. 430-325.000.
Genentech, Inc.: *See*—
Etcheverry, Tina M.; and Hitzeman, Ronald A., 4,940,661, Cl. 435-69.100.
General Electric CGR SA: *See*—
Leroux, Patrick, 4,940,940, Cl. 324-309.000.
General Electric Company: *See*—
Aubert, Donald E.; Wu, You-Sun; and Nerurkar, Vishnu W., 4,940,954, Cl. 332-103.000.
Fritzsche, Harold L., 4,940,913, Cl. 310-216.000.
Herrick, Phillip R.; Ewing, Daniel C.; Wright, Floyd H.; and Truelove, Kevin M., 4,940,932, Cl. 324-158.0MG.
Ingham, Scott W., 4,941,174, Cl. 380-52.000.
Maresca, Louis M., 4,940,771, Cl. 528-199.000.
Temple, Victor A. K., 4,941,026, Cl. 357-23.400.
Tsukida, Robert S., 4,939,940, Cl. 73-864.740.
Yuen, Stanley M., 4,941,117, Cl. 364-724.070.
General Mills, Inc.: *See*—
Duffy, David K., 4,940,593, Cl. 426-94.000.
General Motors Corporation: *See*—
Bien, Paul R., 4,940,002, Cl. 105-136.000.
O'Neill, Stephen P., 4,940,526, Cl. 204-300.0EC.
Geoghegan, Edward J.: *See*—
Sparks, Randall T.; and Geoghegan, Edward J., 4,940,588, Cl. 424-490.000.
George, Harry M.: *See*—
Cote, James H.; Ekberg, Jurgen; Cleevely, Bruce T.; and George, Harry M., 4,940,156, Cl. 220-22.300.
Georgia Tech Research Corporation: *See*—
Hartman, Nile F., 4,940,328, Cl. 356-345.000.
Geratz, Joachim D.: *See*—
Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., 4,940,723, Cl. 514-396.000.
Gerber Scientific Instrument Company, The: *See*—
Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., 4,940,641, Cl. 430-5.000.
Gergely, Vera: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.
Gesellschaft fur Biotechnologische Forschung mbH: *See*—
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.
Getz, Marlyn F.: *See*—
Fife, James A.; and Getz, Marlyn F., 4,940,490, Cl. 75-229.000.
Gewerkschaft Eisenhutte Westfalia GmbH: *See*—
Langenberg, Werner, 4,939,949, Cl. 475-2.000.
Ghiz, Sally: *See*—
Goettl, John M., 4,939,797, Cl. 4-490.000.
Giannantonio, Guiseppe; and de Paolis, Cesare, to Videocolor. Device to shield mask cathode tubes from the earth's magnetic field. 4,940,920, Cl. 315-8.000.
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, to International Paper Company. Oxygen impermeable leak free container. 4,940,612, Cl. 428-34.200.
Gibbons, Gordon H., to Baker Hughes, Inc. Adjustable wearplates rotary pump. 4,940,394, Cl. 417-283.000.
Gibson, Adler E. Method and apparatus for adding predetermined quantity of material to a reactor. 4,940,335, Cl. 366-8.000.
Gilbert, James R.: *See*—
Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank R.; Gilbert, James R.; and Aspen, Frank E., 4,940,495, Cl. 136-256.000.
Gillard, John W.; Yoakim, Christiane; Guindon, Yvan; and Girard, Yves, to Merck Frosst Canada, Inc. Tetrahydrocarbazole esters, pharmaceutical compositions and use. 4,940,719, Cl. 514-381.000.
Gillery, Frank H., to PPG Industries, Inc. Dual bus bar arrangement for an electrically heatable transparency. 4,940,884, Cl. 219-203.000.
Gillespie, John R., to Gillespie & Powers, Inc. Apparatus for generating a vortex in a melt. 4,940,214, Cl. 266-235.000.
Gillespie & Powers, Inc.: *See*—
Gillespie, John R., 4,940,214, Cl. 266-235.000.
Gillett, Richard B., Jr.; and Williams, Douglas D., to Digital Equipment Corporation. Method and apparatus for initiating interlock read transactions on a multiprocessor computer system. 4,941,083, Cl. 364-200.000.
Gillette Company, The: *See*—
Lin, Nan J.; and Hanley, Peter G., 4,940,628, Cl. 428-207.000.
Gilli, Norma L.: *See*—
Grevis, Richard; and Gilli, Norma L., 4,940,054, Cl. 128-419.0PG.
Gilmore, Hugh L. Ball valve. 4,940,210, Cl. 251-160.000.
Gilroy, Gordon C. Aerosol package having compressed gas propellant and vapor tap of minute size. 4,940,171, Cl. 222-402.180.
Giorgi, Ettore, to SAES Getters SpA. Cathode ray tube with an electrophoretic getter. 4,940,300, Cl. 313-559.000.
Gipe, Robert: *See*—
Yokelson, Howard B.; Partenheimer, Walter; and Gipe, Robert, 4,940,810, Cl. 556-438.000.
Gipson, Gregory L. Inner lug removal tool. 4,940,370, Cl. 408-72.00R.
Girard, Marc; and Van Der Werf, Sylvie, to Institut Pasteur. Peptides comprising an immunogenic side of poliovirus and DNAs containing nucleotide sequences coding for these peptides. 4,940,781, Cl. 530-350.000.
Girard, Yves: *See*—
Gillard, John W.; Yoakim, Christiane; Guindon, Yvan; and Girard, Yves, 4,940,719, Cl. 514-381.000.
Giroux, Pierre R. Insulator for overhead electric wires. 4,940,857, Cl. 174-174.000.
Girvin, Robert H., to K G Engineering, Inc. Handlebar assembly for cycles. 4,939,950, Cl. 74-551.200.
Glagovsky, Boris A.: *See*—
Khait, Alexandr L.; Glagovsky, Boris A.; Frenkel, Larisa R.; and Los, Vera S., 4,940,939, Cl. 324-236.000.
Glaser, Klaus: *See*—
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, 4,940,609, Cl. 427-304.000.
Glasgow, Ian K.: *See*—
Enck, Richard S., Jr.; Hindenes, Gregg A.; and Glasgow, Ian K., 4,940,919, Cl. 313-526.000.
Gleason, Curtis A.: *See*—
Tanagho, Emil A.; Schmidt, Richard A.; Gleason, Curtis A.; and Lue, Tom F., 4,940,065, Cl. 128-784.000.
Globig, Michael A.: *See*—
Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., 4,940,331, Cl. 356-349.000.
Glory Kogyo Kabushiki Kaisha: *See*—
Naito, Seishi; Tanabe, Shuji; and Nakashima, Toru, 4,940,938, Cl. 324-212.000.
Glowczewski, Thomas: *See*—
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.
GN Davavox A/S: *See*—
Bergenstoff, Hans; and Otto, Torsten, 4,941,179, Cl. 381-68.400.
Goddard, L. A. Refrigerant recovery and purification system and method. 4,939,903, Cl. 62-77.000.
Goddard, Peggy L.: *See*—
Scott, Douglas R.; Goddard, Peggy L.; and Wagner, Joseph P., 4,940,915, Cl. 310-338.000.
Gode, Peter; Riebe, Jens P.; and Jeromin, Lutz, to Henkel Kommanditgesellschaft auf Aktien. Decentral wastewater treatment process. 4,940,544, Cl. 210-603.000.
Goel, Anil B., to Ashland Oil, Inc. Novel thioether amide diols and polyurethane polymers therefrom. 4,940,769, Cl. 528-85.000.
Goerres, Anton: *See*—
Kastl, Erna; Mathieu, Marion; and Goerres, Anton, 4,940,614, Cl. 428-348.000.
Goettl, John M., to Ghiz, Sally. Water delivery assembly for cleaning swimming pools. 4,939,797, Cl. 4-490.000.
Goetz, Howard V.: *See*—
Pailthorp, Robert M.; Goetz, Howard V.; Bortnem, Mark A.; and Edson, Bruce E., 4,941,082, Cl. 364-167.010.
Gokhale, Ashok J.: *See*—
Burnet, George; and Gokhale, Ashok J., 4,940,611, Cl. 428-2.000.
Gold, Peter N. Window sealing strip for automotive vehicles. 4,939,879, Cl. 52-208.000.
Gold Star Co., Ltd.: *See*—
Sung, Sun K., 4,941,061, Cl. 360-10.200.
Goldberg, Mark: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.
Goldschild, Pierre, to Schlumberger Technology Corporation. Sonde for taking fluid samples, in particular from inside an oil well. 4,940,088, Cl. 166-109.000.
Goldschmidt, Aharon: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.
Goldstar Co., Ltd.: *See*—
Jeong, Dong Kil, 4,941,058, Cl. 360-67.000.
Yoon, Jin H., 4,941,047, Cl. 358-181.000.

Goldstein, Arthur J.; and Parsi, Edgardo J., to Ionics, Incorporated. Apparatus for monitoring the quality of water. 4,940,667, Cl. 436-157.000.

Golino, Carlo M., to Corning Incorporated. Protective coatings for glass and ceramic vessels. 4,940,613, Cl. 428-34.700.

Gordon, Richard A. Animal restraining and training device. 4,940,020, Cl. 119-106.000.

Gordon, Robert T.: *See*—
Leslie, Samuel A.; and Gordon, Robert T., 4,941,200, Cl. 455-17.000.

Goronkov, Nikolai D.: *See*—
Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; Belyaev, Daniil I.; Bondaruk, Andrei V.; and Goronkov, Nikolai D., 4,940,876, Cl. 219-110.000.

Gorst, Alan, to Paramo Tools Group Ltd., The. Knife with retractable blade. 4,939,839, Cl. 30-125.000.

Gorton, Lanny A.; Pelmulder, John P.; Konopka, April A.; and Bloom, William G., to Pacesetter Infusion, Ltd. Piston cap and boot seal for a medication infusion system. 4,940,399, Cl. 417-415.000.

Gosch, Hans-Juergen: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Goto, Nobutaka: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; Naoi, Masayuki; and Fujisawa, Yasuhiro, 4,941,006, Cl. 354-299.000.

Goto, Toshio: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Gotsmann, Guenther: *See*—
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikenscher, Rolf, 4,940,609, Cl. 427-304.000.

Gourlaouen, Claire: *See*—
Sauvion, Guy-Noel; Caillod, Jack; and Gourlaouen, Claire, 4,940,685, Cl. 502-263.000.

Grabietz, Joachim, to Terhorst, Hans; and Grabietz, Joachim. Hot water heater. 4,940,024, Cl. 122-13.00R.

Grabmaier, Josef: *See*—
Hoyler, Gerhard; Grabmaier, Josef; Falckenberg, Richard; and Freienstein, Bernhard, 4,940,568, Cl. 422-245.000.

Grabowski, Edward J. J.: *See*—
Corley, Edward G.; Larsen, Robert D.; Grabowski, Edward J. J.; and Reider, Paul, 4,940,813, Cl. 560-103.000.

Grabowski, Richard M., to Gateway Industries, Inc. Safety belt retractor with improved dampening. 4,940,193, Cl. 242-107.300.

Gradient: *See*—
Kant, Michel; Biedinger, Jean-Marie; Quesnard, Roland; and Galko, Jacques, 4,940,912, Cl. 310-162.000.

Graham, Lawrence D.: *See*—
Jeyarajan, Arunachalam; Graham, Lawrence D.; Brokloff, John E.; and Monte, Louis H., 4,940,073, Cl. 164-361.000.

Grainger, Frederick: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.

Gramberger, Johann, to ZWN Zahnradwerk Neuenstein GmbH; and Miba Sinter. Method for manufacturing a friction ring having a conical or cylindrical friction surface. 4,940,847, Cl. 156-89.000.

Grant, David L., to Compaq Computer Corporation. Method for restoring computer files, including improved steps for location of head clusters of files. 4,941,059, Cl. 360-72.200.

Grant, William N. Bed ventilating apparatus and method. 4,939,804, Cl. 5-468.000.

Grape, Wolfgang; Schlak, Ottfried; de Montigny, Armand; and Kober, Hermann, to Bayer Aktiengesellschaft. Silicone resin emulsion. 4,940,743, Cl. 524-377.000.

Grapentin, Hans-Joachim; Seidenspinner, Hubert-Matthias; and Tessmann, Detlef, to Schering Aktiengesellschaft. Conditioning agent for the treatment of base materials. 4,940,554, Cl. 252-357.000.

Gray, Regina: *See*—
Silk, Vicki A.; and Gray, Regina, 4,940,620, Cl. 428-81.000.

Graziani, Gabriele: *See*—
Nardi, Dante; Leonardi, Amedeo; Catto, Alberto; and Graziani, Gabriele, 4,940,711, Cl. 514-255.000.

Greenberg, Stephen M.; and Frischling, Louis A., to Lipo Chemicals Inc. Ester based water-in-oil cosmetic microemulsions. 4,940,577, Cl. 424-59.000.

Grevis, Richard; and Gilli, Norma L., to Telectronics N.V. Apparatus and method for controlling multiple sensitivities in arrhythmia control system including post therapy packing delay. 4,940,054, Cl. 128-419.0PG.

Gribbin, John D.: *See*—
Dinter, Peter; Dallmann, Hermann; Bothe, Lothar; and Gribbin, John D., 4,940,521, Cl. 204-164.000.

Grieb, Hubert, to MTU Motoren Und Turbinen- Union Munchen GmbH. Heat exchanger comprised of sections detachably and sealably clamped together and its method of assembly. 4,940,084, Cl. 165-76.000.

Gries, Josef: *See*—
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.

Grillo, John M.; Hilby, James A.; Fleet, Vern V.; Gardella, Cameron G.; and Hill, Gary J., to Torrington Company, The. Antifriction bearing with a clip-on sensor cooperating with a shaft mounted magnetic encoder retainer ring. 4,940,936, Cl. 324-174.000.

Ground Control, Inc.: *See*—
Rozanc, Richard A., 4,940,365, Cl. 405-261.000.

Groves, Maurice C., to Amcor Limited. Container. 4,940,190, Cl. 229-122.000.

Gruenewald, Bryan E.; and Lokken, Clayton A., to Briggs & Stratton Corporation. Lock construction. 4,939,916, Cl. 70-373.000.

Grumman Aerospace Corporation: *See*—
Seib, Bill G., 4,940,252, Cl. 280-418.100.

Grund, Gerhard; and Kempken, Rainer, to Paul Forkardt GmbH & Co., KG. Arrangement for mounting a power-operated clamping device on a machine-tool spindle. 4,939,966, Cl. 82-165.000.

Grunzweig & Hartmann AG: *See*—
Naber, Wilfried; Ungerer, Heinz-Jurgen; and Sistermann, Klaus, 4,940,478, Cl. 65-27.000.

GTE Laboratories Incorporated: *See*—
Chuang, Chin-Kuang, 4,941,178, Cl. 381-41.000.
Olshansky, Robert; and Lanzisera, Vincent, 4,941,208, Cl. 455-618.000.
Su, Sophia R.; Fitzpatrick, Leo F.; and Robillard, Sheryl A., 4,940,571, Cl. 423-339.000.

GTE Products Corporation: *See*—
Jones, Gerald M., 4,939,847, Cl. 33-545.000.
Rutfield, Sharon B., 4,940,918, Cl. 313-487.000.

Gu, Hansen; and Wu, Dumin. Apparatus for detecting bioelectric signals. 4,940,060, Cl. 128-735.000.

Guffey, Timothy B.: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Guindon, Yvan: *See*—
Gillard, John W.; Yoakim, Christiane; Guindon, Yvan; and Girard, Yves, 4,940,719, Cl. 514-381.000.

Guinn, Perry W., to CD Medical, Inc. Method and apparatus for single needle dialysis. 4,940,455, Cl. 604-5.000.

Gulczynski, Zdzislaw. Power switch driver. 4,940,906, Cl. 307-296.100.

Gulczynski, Zdzislaw. High speed integrating analog-to-digital converter. 4,940,982, Cl. 341-169.000.

Gunawardena, Charith A.: *See*—
Cowlin, Simon; Clark, Leslie J.; Dennis, Timothy J.; and Gunawardena, Charith A., 4,940,536, Cl. 209-592.000.

Gundlach, Kurt, to Du Pont de Nemours, E. I., and Company. Photographic antistatic element having a backing layer with improved adhesion and antistatic properties. 4,940,655, Cl. 430-523.000.

Gupta, Omkarnath R.: *See*—
Nelson, Richard D.; Gupta, Omkarnath R.; and Herrell, Dennis J., 4,940,085, Cl. 165-80.300.

Gurth, Max I. Rotary disc pump. 4,940,385, Cl. 415-206.000.

Gutman, Jose; and Shapiro, Steven C., to Motorola Inc. Paging system with improved acknowledge-back capabilities. 4,940,963, Cl. 340-313.000.

Gutsche, Herbert: *See*—
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.

Gyoutoku, Yasuhiro: *See*—
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,941,002, Cl. 346-160.000.

Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, to Bell & Howell Phillipsburg Company. Insertion machine. 4,939,887, Cl. 53-460.000.

Habelt, Gerhard; and Mucha, Franz, to U.S. Philips Corporation. Thermal printer. 4,940,994, Cl. 346-76.0PH.

Haefner, Donald R.: *See*—
Preston, David M.; and Haefner, Donald R., 4,940,109, Cl. 180-197.000.

Hagins, William A.; and Yoshikami, Shuko, to United States of America, Health and Human Services. Pyroelectric calorimeter. 4,940,896, Cl. 250-338.300.

Hahn, Blake S. Adjustable bundling device. 4,939,818, Cl. 24-16.00R.

Hahn, Patricia W.: *See*—
Yasosky, John J.; Hahn, Patricia W.; and Atwell, William A., 4,940,595, Cl. 426-243.000.

Hahn, Terrence S.: *See*—
Pellman, Mark A.; Kilhefner, Paul T., III; and Hahn, Terrence S., 4,940,072, Cl. 164-35.000.

Halbritter, Klaus: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Halczenko, Wasyl: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.

Hale, William J.: *See*—
Horst, William R.; and Hale, William J., 4,941,205, Cl. 455-605.000.

Hall, Anson L. Support for eating utensils. 4,940,199, Cl. 248-37.300.

Hall, Dennis C. Cartridge holder. 4,940,135, Cl. 206-3.000.

Hall, Jack: *See*—
Terwilliger, Richard A.; Hebert, Daniell; and Hall, Jack, 4,940,061, Cl. 128-754.000.

Halogh, Maria: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.
Ham, Richard G.: *See*—
Boyce, Stephen T.; and Ham, Richard G., 4,940,666, Cl. 435-240.200.
Hamada, Akiyoshi, to Minolta Camera Kabushiki Kaisha. Optical scanning device using plural sources of differing wavelengths. 4,940,310, Cl. 250-236.000.
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, to Taiyo Yuden Company, Ltd. Optical information recording medium. 4,940,618, Cl. 428-64.000.
Hamada, Hayato: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.
Hamada, Shunichiro: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.
Hamamoto, Masato: *See*—
Kobayashi, Tohru; Hamamoto, Masato; and Yamada, Toshio, 4,940,905, Cl. 307-278.000.
Hamamoto, Tadanao; Wakiya, Tadashi; and Hayasi, Kazunari, to Kabushiki Kaisha Tokai Rika Denki Seisakusho. Electric rearview mirror system for motor vehicle. 4,940,322, Cl. 350-637.000.
Hamatani, Toshiji, to Semiconductor Energy Laboratory Co., Ltd. Liquid crystal display having a built-in photoelectric conversion device. 4,940,313, Cl. 350-342.000.
Hamel, Dominique: *See*—
Boule, Jean-Pierre; Hamel, Dominique; Hamel, Dominique; and Menconi, Martial, 4,941,173, Cl. 380-25.000.
Boule, Jean-Pierre; Hamel, Dominique; Hamel, Dominique; and Menconi, Martial, 4,941,173, Cl. 380-25.000.
Hamlin, Mindy A.; and Kaplinsky, George, to Hewlett-Packard Company. Out-of-ink sensing method. 4,940,997, Cl. 346-140.00R.
Hammer, Klaus-Dieter; and Winter, Hermann, to Hoechst Aktiengesellschaft. Tubular foodstuff casing made of cellulose hydrate, in particular synthetic sausage casing. 4,940,615, Cl. 428-34.800.
Hampton, Hilary J.; Gaiser, John W.; Taylor, Charles S.; and Machold, Timothy R., to Advanced Cardiovascular Systems, Inc. Guiding member with deflectable tip. 4,940,062, Cl. 128-772.000.
Hanada, Toshiro: *See*—
Hirai, Hidematsu; Hanada, Toshiro; Yamanishi, Kazuhiko; and Nohara, Hideko, 4,940,660, Cl. 435-7.000.
Hancock, Mark W.; and May, Marvin M., to Aquatec. Drink dispenser and method of preparation. 4,940,164, Cl. 222-66.000.
Hancock, William R.; Short, Paul J.; and Weingartner, Thomas A., to Honeywell Inc. Elliptical arc generator for display systems. 4,941,116, Cl. 364-718.000.
Hanisko, John-Cyril P., to TRW Inc. Method and apparatus for controlling a power assist steering system. 4,940,107, Cl. 180-142.000.
Hanley, Peter G.: *See*—
Lin, Nan J.; and Hanley, Peter G., 4,940,628, Cl. 428-207.000.
Hapworth, Mada S.: *See*—
Hapworth, William E.; and Hapworth, Mada S., 4,940,585, Cl. 424-464.000.
Hapworth, William E.; and Hapworth, Mada S. Method for the treatment of nicotine withdrawal syndrome. 4,940,585, Cl. 424-464.000.
Hara, Eiichi: *See*—
Nagata, Tatsuya; Yamada, Takehiko; Hara, Eiichi; and Watanabe, Michihiro, 4,940,888, Cl. 250-208.100.
Hara, Makoto; Hashiue, Masakazu; and Tanaka, Kazuyoshi, to Fuji Photo Filom Co., Ltd. Signal processing method for determining base sequence of nucleic acid. 4,941,092, Cl. 364-413.150.
Hara, Yoshifumi: *See*—
Sakurai, Tsutomu; Hara, Yoshifumi; and Dougakiuchi, Yasumasa, 4,941,206, Cl. 455-607.000.
Hara, Yoshimasa, to Brother Kogyo Kabushiki Kaisha. Exposure device using CRT as exposure light source. 4,941,013, Cl. 355-20.000.
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Youji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, to Amao Co., Ltd.; and Nippondenso Co., Ltd. Power supplying system for self-driving closure device. 4,939,867, Cl. 49-349.000.
Harada, Masatomi: *See*—
Tsukamoto, Shin-ichi; Nagaoka, Hitoshi; Usuda, Shinji; Harada, Masatomi; and Tamura, Toshinari, 4,940,795, Cl. 546-16.000.
Harbarger, Josephine, to Motorola Inc. Lapping means and method. 4,940,507, Cl. 156-636.000.
Harder, Wolfgang: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.
Harima Chemial Industrial Co., Ltd.: *See*—
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Harris Corporation: *See*—
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Harrison, John M. M., to J. M. Huber Corporation. Froth flotation column. 4,940,534, Cl. 209-169.000.
Harsing, Laszlo : *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.
Hart, George M.: *See*—
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Hartman, George D.: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.
Hartman, Nile F., to Georgia Tech Research Corporation. Optical sensing apparatus and method. 4,940,328, Cl. 356-345.000.
Hartman, Peter: *See*—
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.
Hartmann, Heinrich: *See*—
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Webern-doerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, 4,940,514, Cl. 162-168.200.
Hartson, Ted E.; and Kelly, Gordon E., to Zenith Electronics Corporation. Decoder-operated television signal switch. 4,941,048, Cl. 358-181.000.
Hary, Joseph M.: *See*—
Darnell, Michael J.; Hary, Joseph M.; and Quinn, Robert J., 4,941,102, Cl. 364-513.000.
Hasebe, Kouki, to Kabushiki Kaisha Toshiba. Bit map display apparatus for performing an interruption display among planes at high speed. 4,940,971, Cl. 340-721.000.
Hasebe, Kouki, to Kabushiki Kaisha Toshiba. Image data processing apparatus. 4,941,107, Cl. 364-518.000.
Hasegawa, Akira, to Toyota Jidosha Kabushiki Kaisha. Power-assisted steering apparatus. 4,940,104, Cl. 180-132.000.
Hasegawa, Atsushi: *See*—
Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, 4,941,085, Cl. 364-200.000.
Hasegawa, Iwao, to Kabushiki Kaisha Toshiba. Electronic private branch exchange. 4,941,171, Cl. 379-233.000.
Hasegawa, Masayuki: *See*—
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Hashimoto, Masaki; and Yamaguchi, Noboru, to Araya Industrial Co., Ltd. Construction for joining chainstay and seat pipes to a rear dropout in a bicycle frame. 4,940,356, Cl. 403-266.000.
Hashimoto, Masashi, to Texas Instruments Inc. Method for operating semiconductor memory system in the storage and readout of video signal data. 4,941,127, Cl. 365-189.010.
Hashimoto, Masashi: *See*—
Shimazaki, Norihiko; Hemmi, Keiji; Nakaguti, Osamu; Miyazaki, Yoshio; and Hashimoto, Masashi, 4,940,709, Cl. 514-253.000.
Hashiue, Masakazu: *See*—
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Hashmoto Forming Industry Co., Ltd.: *See*—
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Hasbeck, John L.: *See*—
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Hass, Juergen; and Hotea, Gheorghe, to AMP Incorporated. Electrical contact member. 4,940,425, Cl. 439-397.000.
Hatabu, Shoji: *See*—
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Hatakoshi, Makoto: *See*—
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Hatcher, David C.: *See*—
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Hatori, Masami, to Fuji Photo Film Co., Ltd. Optical deflecting apparatus. 4,940,304, Cl. 350-96.130.
Hattori, Katsuhiko: *See*—
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Hattori, Kenji, to Honda Giken Kogyo Kabushiki Kaisha; and NTN Corporation. Pulse generating ring for electromagnetic rotary position detection. 4,940,937, Cl. 324-207.220.
Haub, Martin: *See*—
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Haubursin, Pierre F., to Advanced Micro Devices, Inc. Weak/strong bus driver. 4,941,126, Cl. 364-900.000.
Hauton, Francois; Dumas, Frederic; Bouttemy, Franck; and Huc, Christian, to OV'Action S.A. An installation for the shaping of a continuous food product while it is hardening. 4,940,866, Cl. 219-10.55A.
Hawe, Malcolm: *See*—
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Paulshus, Bjorn; and Hawley, Phil, 4,940,362, Cl. 405-224.000.
Hay, Robert A., II; and Dowell, Albert C., to Dow Chemical Company, The. Centrifugal devolatilizer. 4,940,472, Cl. 55-195.000.
Hayakawa, Hisashi: *See*—
Kawashima, Kazuki; Yasui, Makoto; Hayakawa, Hisashi; and Imoto, Masayuki, 4,940,447, Cl. 474-110.000.

Hayakawa, Junichi, to Velbon International Corporation. Leg pad and spike for tripod. 4,940,203, Cl. 248-188.900.
Hayakawa, Kunio: *See*—
Iiyama, Kiyotaka; and Hayakawa, Kunio, 4,940,691, Cl. 503-220.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, to Sharp Kabushiki Kaisha. Semiconductor apparatus. 4,941,024, Cl. 357-4.000.
Hayano, Shin-ichiro, to NEC Corporation. Time division switching for multi-channel calls using two time switch memories acting as a frame aligner. 4,941,141, Cl. 370-58.100.
Hayasaki, Koichi, to Nissan Motor Co., Ltd. Fail-safe hydraulic control for a forward clutch in a continuously variable transmission. 4,939,958, Cl. 74-867.000.
Hayashi, Masamichi: *See*—
Saijo, Hiromitsu; Hayashi, Masamichi; and Morikawa, Takeji, 4,940,014, Cl. 118-653.000.
Hayashi, Yasutaka: *See*—
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Hazelett Strip-Casting Corporation: *See*—
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Hazenbroek, Jacobus E. Apparatus for removing the legs from back portion of poultry. 4,939,813, Cl. 17-11.000.
Heath, Edward A. Unitary collapsible and disposable pet litter container. 4,940,016, Cl. 119-1.000.
Heaton, David W.: *See*—
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Hebert, Daniell: *See*—
Terwilliger, Richard A.; Hebert, Daniell; and Hall, Jack, 4,940,061, Cl. 128-754.000.
Hecht, David L., to Xerox Corporation. Variable wavelength discrete optical image bars having passively enhanced spatial addressing capacity. 4,940,314, Cl. 350-355.000.
Heck, Gerard L.; and DeSimone, John A., to Center for Innovative Technology. Electrogustograph. 4,940,056, Cl. 128-639.000.
Hefti, Heinz: *See*—
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Heidelberger Druckmaschinen AG: *See*—
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Heidotting, Werner; Scheffner, Wolfgang; and Duerkop, Willi, to C. A. Weidmueller GmbH & Co. Electrical connector with resilient retaining means. 4,940,428, Cl. 439-598.000.
Heifetz, Aaron H.: *See*—
Braatz, James A.; Heifetz, Aaron H.; Wolfe, Richard A.; and Luthra, Narender P., 4,940,737, Cl. 521-103.000.
Heim, Hans; and Klein, Hermann-Josef, to Robert Bosch GmbH. Control circuit and method for controlling the speed of an electric fuel pump for an internal combustion engine equipped with fuel injection. 4,940,034, Cl. 123-497.000.
Heine, Gerold: *See*—
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Heinz, Gerhard: *See*—
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Heiz, Ueli: *See*—
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Helfrick, Albert D., to Tel-Instrument Electronics Corporation. Frequency synthesis method and apparatus using approximation to provide closely spaced discrete frequencies over a wide range with rapid acquisition. 4,940,950, Cl. 331-2.000.
Helling, James C.; Beckrot, Anders W.; and Murray, Scott V., to LumiTech International, L.P. Combination ballast and cold cathode sealed lamp and method. 4,940,921, Cl. 315-219.000.
Hemmi, Keiji: *See*—
Shimazaki, Norihiko; Hemmi, Keiji; Nakaguti, Osamu; Miyazaki, Yoshio; and Hashimoto, Masashi, 4,940,709, Cl. 514-253.000.
Hemmingsen, Hans; Christensen, Lars S.; and Monnike, Kristian B., to Eskofot A/S. A method for obtaining data from an original document using a camera supported or an air cushion. 4,941,056, Cl. 358-497.000.
Hencz, Edward T. Snow removal device. 4,939,807, Cl. 15-111.000.
Hendren, Gary L.; and Hesler, Lee J., to Du Pont de Nemours, E. I., and Company. Cross-directional distribution of additives in synthetic papers. 4,940,512, Cl. 162-109.000.
Henkel Kommanditgesellschaft auf Aktien: *See*—
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Henley Manufacturing Holding Company, Inc.: *See*—
Mills, Jesse V., 4,940,048, Cl. 123-90.390.
Henn, Klaus. Fastening element. 4,939,822, Cl. 24-271.000.
Hennemann, Lothar-Roland, to Wago Verwaltungsgesellschaft mbH. Series terminal for two-wire power supply to electrical or electronic components, especially initiators. 4,940,431, Cl. 439-716.000.
Hennings, David R.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.
Henry, Yves; and Arques, Marc, to Thomson-CSF. X-ray imaging device. 4,940,901, Cl. 250-370.090.
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Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.
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Hermann Berstorff Maschinenbau GmbH: *See*—
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Hermanns, Martin J.: *See*—
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Hermansen, Ralph D.; Sutherland, Thomas H.; and Predmore, Roamer. Method of bonding metals with a radio-opaque adhesive/sealant for void detection and product made. 4,940,633, Cl. 428-324.000.
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara/Rt. Quinoline carboxylic acid boric acid anhydrides. 4,940,794, Cl. 546-13.000.
Herrell, Dennis J.: *See*—
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Herrick, Phillip R.; Ewing, Daniel C.; Wright, Floyd H.; and Truelove, Kevin M., to General Electric Company. Method and apparatus for testing dynamoelectric machine rotors. 4,940,932, Cl. 324-158.0MG.
Hertler, Walter R.: *See*—
Boettcher, Fritz P.; Dicker, Ira B.; Ebersole, Richard C.; and Hertler, Walter R., 4,940,760, Cl. 526-190.000.
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Hesler, Lee J.: *See*—
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Hesse, Kurt. Race track having lateral edges and bridges for retaining toy vehicles. 4,940,443, Cl. 446-445.000.
Hester Industries, Inc.: *See*—
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Hewett, Richard H.; and Luscombe, Brian M., to May and Baker Limited. Herbicidal method comprising the use of diflufenican. 4,940,484, Cl. 71-94.000.
Hewlett-Packard Company: *See*—
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Bohley, Thomas K.; Garnett, Grosvenor H.; Koerner, Christopher; and Moore, Charles E., 4,940,979, Cl. 341-152.000.
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Heyne, Dennis J., to J. I. Case Company. Rotary swivel for cab heating system. 4,940,182, Cl. 237-12.30B.
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Hicks, Michael E., to Crossfield Electronics Limited. Signal processing circuit and method. 4,941,051, Cl. 358-213.160.
Hieb, Larry E., to Vendo Company, The. Ramp apparatus. 4,940,161, Cl. 221-67.000.
Hienerwadel, Klaus; and Weth, Gerald, to U.S. Philips Corp. Predictive encoder for still pictures. 4,941,053, Cl. 358-261.200.
Higashiyama, Shunichi: *See*—
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Higgins, Robert J., Jr., to Motorola, Inc. Temperature compensated stripline structure. 4,940,955, Cl. 333-204.000.
Higuchi, Youji: *See*—
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Hilby, James A.: *See*—
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Hilgers, Heinz; Morbitzer, Rainer; and Windeln, Johannes, to International Business Machines Corporation. Method of increasing the lubricant retention of magnetic disks. 4,940,606, Cl. 427-130.000.
Hilker, Scott A.: *See*—
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Hill, William H.; and Donner, Joseph E., to Hughes Aircraft Company. Force limiting weld head. 4,940,875, Cl. 219-89.000.
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Hillenbrand, Gary F.: *See*—
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Hilsman, Y. Gilbert, III, to Dowell Schlumberger Incorporated. Gravel packing tool. 4,940,093, Cl. 166-332.000.
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Hiltunen, Matti; Lundqvist, Ragnar; and Sarkki, Juha, to A. Ahlstrom Corporation. Fast fluidized bed reactor. 4,940,007, Cl. 110-347.000.
Hincks, Daniel A.; Hincks, William T.; and Hincks, Robert W., to Data Management, Inc. One-write book assembly with removable insert. 4,940,257, Cl. 282-29.00B.
Hincks, Robert W.: *See*—
Hincks, Daniel A.; Hincks, William T.; and Hincks, Robert W., 4,940,257, Cl. 282-29.00B.
Hincks, William T.: *See*—
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Hindenes, Gregg A.: *See*—
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Hine, Nathan P.; and Wells, Robert L., Jr., to Spectra, Inc. Removal of dissolved gas from ink in an ink jet system. 4,940,995, Cl. 346-140.00R.
Hino Jidosha Kogyo Kabushiki Kaisha (Hino Motors, Ltd.): *See*—
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Hinterwaldner, Rudolf. Hydrophobic and/or abhesive materials, reactive diluents. 4,940,846, Cl. 427-385.500.
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Hirai, Hidematsu; Hanada, Toshiro; Yamanishi, Kazuhiko; and Nohara, Hideko, to Wako Pure Chemical Industries. Color developing method in clinical examinations. 4,940,660, Cl. 435-7.000.
Hirai, Nobuki: *See*—
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Hirota, Yoshitaka; Tanaka, Yukitaka; and Urata, Kouichi, to Kao Corporation. Esterification process of fats and oils and enzymatic preparation to use therein. 4,940,845, Cl. 435-134.000.
Hirschberger, Michael, to Hoover Universal, Inc. Dual parison extrusion head for multi-layer blow molding. 4,940,403, Cl. 425-133.100.
Hiscock, Laura J.: *See*—
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Hishikawa, Yasuhide: *See*—
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Hitachi Engineering Co., Ltd.: *See*—
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Hitachi, Ltd.: *See*—
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Ishizuki, Toshio; Fukuda, Yoshio; and Honda, Ken-ichi, 4,939,930, Cl. 73-780.000.
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Nagata, Tatsuya; Yamada, Takehiko; Hara, Eiichi; and Watanabe, Michihiro, 4,940,888, Cl. 250-208.100.
Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, 4,941,129, Cl. 365-230.030.
Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, 4,941,085, Cl. 364-200.000.
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Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.
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Hitachi Maxell, Ltd.: *See*—
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Hitachi Micr·computer Engineering Ltd.: *See*—
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Hitachi Naka Electronics Co., Ltd.: *See*—
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Hitachi VLSI Engineering Corp.: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.
Hitzeman, Ronald A.: *See*—
Etcheverry, Tina M.; and Hitzeman, Ronald A., 4,940,661, Cl. 435-69.100.
Hlobil, Thomas: *See*—
Farrell, Christopher J.; Hlobil, Thomas; and Nahill, George F., 4,940,158, Cl. 220-258.000.
Ho, Anh V.: *See*—
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.
Hoechst AG: *See*—
Honel, Michael; Finke, Manfred; Walz, Gerd; and Ziegler, Peter, 4,940,768, Cl. 528-45.000.
Hoechst Aktiengesellschaft: *See*—
Dinter, Peter; Dallmann, Hermann; Bothe, Lothar; and Gribbin, John D., 4,940,521, Cl. 204-164.000.
Frommeld, Hans-Dieter; and Wiezer, Hartmut, 4,940,647, Cl. 430-271.000.
Hammer, Klaus-Dieter; and Winter, Hermann, 4,940,615, Cl. 428-34.800.
Kastl, Erna; Mathieu, Marion; and Goerres, Anton, 4,940,614, Cl. 428-348.000.
Pawlowski, Georg, 4,940,646, Cl. 430-175.000.
Schwertfeger, Werner, 4,940,814, Cl. 562-849.000.
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,940,790, Cl. 544-8.000.
Weber, Jurgen; Kampmann, Detlef; Thonnessen, Franz; and Kniep, Claus, 4,940,818, Cl. 564-471.000.
Hoechst Celanese Corporation: *See*—
Geiger, Margaret W., 4,940,648, Cl. 430-272.000.
Hoechst-Roussel Pharmaceutical Inc.: *See*—
Effland, Richard C.; and Klein, Joseph T., 4,940,704, Cl. 514-211.000.
Hoekema, Andreas: *See*—
Schilperoort, Robbert A.; Hoekema, Andreas; and Hooykaas, Paul J. J., 4,940,838, Cl. 800-205.000.
Hoeschele, Marc: *See*—
Best, Jerry; Bourne, Richard C.; Hoeschele, Marc; and Bos, Willem, 4,940,079, Cl. 165-2.000.
Hoffman, Dietrich, to Mauser-Werke Oberndorf GmbH. Article of ammunition. 4,939,997, Cl. 102-503.000.
Hoffman, James: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.
Hoffman-La Roche Inc.: *See*—
Klaus, Michael; Mohr, Peter; and Weiss, Ekkehard, 4,940,707, Cl. 514-237.800.
Hoffman, Norman E.: *See*—
Consoli, John J.; and Hoffman, Norman E., 4,940,432, Cl. 439-862.000.
Hoffmann, Michel: *See*—
Scholtes, Pierre; and Hoffmann, Michel, 4,940,869, Cl. 219-10.55F.
Hofle, Gerhard: *See*—
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.
Hofmann, Manfred, to Hofmann & Voelkel GmbH. Portable ion generator. 4,941,068, Cl. 361-231.000.
Hofmann, Otto, to Messerschmitt-Bolkow-Blohm GmbH. Scanning prism. 4,940,312, Cl. 350-286.000.
Hofmann & Voelkel GmbH: *See*—
Hofmann, Manfred, 4,941,068, Cl. 361-231.000.
Hokuyo, Shigeru: *See*—
Matsumoto, Hideo; Sato, Katsumi; and Hokuyo, Shigeru, 4,940,496, Cl. 136-256.000.
Holbrook, Gerald L.: *See*—
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.
Holderegger, Jurg; and Simson, Dionizy, to Holderegger, Jurg. Mounting device for mounting a squeegee or inking blade in a printing press. 4,940,354, Cl. 403-5.000.
Holland-Letz, Guenter: *See*—
Weigel, Peter; and Holland-Letz, Guenter, 4,940,223, Cl. 271-181.000.
Hollander, Jan, to B. V. Asphalt- en Chemische Fabrieken Smid & Hollander. Method of manufacturing a perforated roofing material. 4,940,501, Cl. 156-252.000.

Holley Engineering Company, Inc.: *See*—
Holley, John D., 4,940,001, Cl. 104-307.000.
Holley, John D., to Holley Engineering Company, Inc. Rail spike cleaning apparatus. 4,940,001, Cl. 104-307.000.
Hollingsworth GmbH: *See*—
Schmolke, Karl-Heinz, 4,939,897, Cl. 57-301.000.
Holmes, Maurice F.; Roller, George J.; and Moore, Steven R., to Xerox Corporation. Hybrid sequenced document copying system. 4,941,023, Cl. 355-319.000.
Holmes, Richard E.: *See*—
Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., 4,940,718, Cl. 514-370.000.
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, to Daimler-Benz AG. Bidirectional pressure supply system in a motor vehicle. 4,939,899, Cl. 60-412.000.
Hombrecher, Fritz, to ERSA Sachs KG GmbH & Co. Soldering iron. 4,940,178, Cl. 228-55.000.
Homeyer, Bernhard: *See*—
Maurer, Fritz; Homeyer, Bernhard; and Behrenz, Wolfgang, 4,940,698, Cl. 514-86.000.
Honda Giken Kogyo Kabushiki Kaisha: *See*—
Aihara, Yasuyuki; Kano, Hideki; Tsuchiya, Yoshikazu; and Miyazaki, Noboru, 4,940,423, Cl. 439-369.000.
Furumoto, Mitsumasa; Kawahara, Eiichiro; Ikejiri, Kenichi; and Yamamoto, Noboru, 4,939,900, Cl. 60-456.000.
Hattori, Kenji, 4,940,937, Cl. 324-207.220.
Ichimura, Takashi; Takamatsu, Koji; Konuma, Takayuki; and Tsukui, Takaaki, 4,939,898, Cl. 60-274.000.
Maki, Kazuya; Koyama, Hideo; and Suzuta, Takeo, 4,939,981, Cl. 91-166.000.
Maki, Toshio; Miura, Chiyoshi; and Kono, Michitoshi, 4,939,829, Cl. 29-159.200.
Nogami, Yoshio; Matsuo, Yoshihiro; Fujii, Takayuki; and Urashi, Seiichi, 4,940,111, Cl. 180-219.000.
Sakai, Jun; and Natsume, Takeshi, 4,940,610, Cl. 427-355.000.
Sato, Makoto, 4,940,291, Cl. 303-15.000.
Honda, Ken-ichi: *See*—
Ishizuki, Toshio; Fukuda, Yoshio; and Honda, Ken-ichi, 4,939,930, Cl. 73-780.000.
Honda, Takaaki: *See*—
Ohmine, Toshimitsu; Honda, Takaaki; and Akagawa, Keiiti, 4,940,213, Cl. 266-152.000.
Honda, Takao; and Kobayashi, Yoshiaki, to Canon Kabushiki Kaisha. Apparatus for developing electrostatic latent image. 4,941,019, Cl. 355-251.000.
Honda, Takashi: *See*—
Aizawa, Motohiro; Ohsumi, Katsumi; Honda, Takashi; and Itow, Hisao, 4,940,564, Cl. 376-306.000.
Honel, Michael; Finke, Manfred; Walz, Gerd; and Ziegler, Peter, to Hoechst AG. Curing agent for synthetic resins, curable mixtures containing this curing agent and its use. 4,940,768, Cl. 528-45.000.
Honeycutt, LeRoy, III; Key, James C.; and Moody, Herbert, III, to Reynolds Metals Company. Method of and apparatus for direct metal strip casting. 4,940,077, Cl. 164-463.000.
Honeywell Incorporated: *See*—
Detweiler, James P., 4,940,930, Cl. 323-273.000.
Hancock, William R.; Short, Paul J.; and Weingartner, Thomas A., 4,941,116, Cl. 364-718.000.
Lamberg, John R., 4,940,953, Cl. 331-96.000.
Hong, Seokwon: *See*—
Paik, Sanghoon; and Hong, Seokwon, 4,940,868, Cl. 219-10.55E.
Honjo, Takeshi: *See*—
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Honma, Mitsutaka: *See*—
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.
Hoog, Waldemar: *See*—
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,940,142, Cl. 206-444.000.
Hoover, Richard B., to United States of America, National Aeronautics and Space Administration. Multispectral glancing incidence x-ray telescope. 4,941,163, Cl. 378-43.000.
Hoover Universal, Inc.: *See*—
Hirschberger, Michael, 4,940,403, Cl. 425-133.100.
Hooykaas, Paul J. J.: *See*—
Schilperoort, Robbert A.; Hoekema, Andreas; and Hooykaas, Paul J. J., 4,940,838, Cl. 800-205.000.
Horan, William J.: *See*—
Sabhlok, Jatinder P.; Horan, William J.; and Carlton, Donna K., 4,940,591, Cl. 426-94.000.
Horiki, Seinosuke; and Makino, Reiji. Masking member. 4,940,624, Cl. 428-159.000.
Horimoto, Akiko: *See*—
Yokoyama, Hitoshi; Sano, Hiroyuki; Horimoto, Akiko; and Kizaki, Masatoshi, 4,940,600, Cl. 426-582.000.
Horn, Darrell C.; and Lennox, John M., III, to Blentech Corporation. Reversing blender agitators. 4,941,132, Cl. 366-278.000.
Horne, Colin; and Morgan, Edward B. Water turbine arrangement for power generation. 4,940,387, Cl. 415-221.000.
Hornstein, Allan S., to Queen City Group. Container with collapsible cup. 4,940,138, Cl. 206-218.000.
Horsch, Robert B.: *See*—
Shah, Dilip M.; Rogers, Stephen G.; Horsch, Robert B.; and Fraley, Robert T., 4,940,835, Cl. 800-205.000.
Horst, William R.; and Hale, William J., to NCR Corporation. Bidirectional optical data communications system. 4,941,205, Cl. 455-605.000.
Horvath, Agnes: *See*—
Hermecz, Istvan; Kereszturi, Gaza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.
Horvath, Kordelia; and Horvath, Victor. Boxing training device. 4,940,228, Cl. 272-76.000.
Horvath, Laszlo; Martin, Georges; and Schween, Heiner, to Sysmo S.A. Modular installation for controlled transport of parts or products. 4,940,000, Cl. 104-295.000.
Horvath, Victor: *See*—
Horvath, Kordelia; and Horvath, Victor, 4,940,228, Cl. 272-76.000.
Hosan, Hans-Josef; and Knopp, Axel, to Stabilus GmbH. Steplessly adjustable vertical movement device. 4,940,202, Cl. 248-162.100.
Hoshino Gakki Corporation: *See*—
Hoshino, Yoshihiro; and Matsui, Kazuhiro, 4,939,970, Cl. 84-293.000.
Hoshino, Osamu: *See*—
Uchida, Takashi; Hoshino, Osamu; and Murayama, Yasushi, 4,941,021, Cl. 355-285.000.
Hoshino, Yoshihiro; and Matsui, Kazuhiro, to Hoshino Gakki Corporation. Connector for body and neck of stringed instruments, like guitars. 4,939,970, Cl. 84-293.000.
Hoskin, Dennis H.; and Shu, Paul, to Mobil Oil Corporation. Organically crosslinked polyvinyl alcohol copolymeric gels for use under harsh reservoir conditions. 4,940,090, Cl. 166-270.000.
Hosono, Masaki: *See*—
Inui, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, 4,940,446, Cl. 474-91.000.
Hosoya, Masakazu: *See*—
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Hotea, Gheorghe: *See*—
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Hou, Jack. Transmission mechanism for music box ornament. 4,939,944, Cl. 74-49.000.
Houck, David R.: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.
Houk, Theodore L.; and Falk, R. Aaron, to Boeing Company, The. Integrated optics waveguides with large phase shifts. 4,940,302, Cl. 350-96.120.
Howard, James K.: *See*—
Fontana, Robert E., Jr.; Howard, James K.; Lee, James H.; and Lefakis, Haralambos, 4,940,511, Cl. 156-656.000.
Howard, Mark J.: *See*—
Font Freide, Joseph J.; Howard, Mark J.; and Lomas, Trevor A., 4,940,826, Cl. 585-600.000.
Hoybond Limited: *See*—
Jackson, David H., 4,940,195, Cl. 244-1.00R.
Hoyler, Gerhard; Grabmaier, Josef; Falckenberg, Richard; and Freienstein, Bernhard, to Siemens Aktiengesellschaft. Arrangement for the continuous melting of granulated silicon for a band-drawing method. 4,940,568, Cl. 422-245.000.
Hoyt, John G. Foldable mast assembly. 4,940,008, Cl. 114-39.100.
Huang, Phen-Lan: *See*—
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.
Huang, Shu-Jen; and Scheimann, David W., to Nalco Chemical Company. Composition for the paint detackification for both waterborne and solvent enamels. 4,940,491, Cl. 134-38.000.
Hubele, Adolf, to Ciba-Geigy Corporation. Microbicides. 4,940,806, Cl. 549-365.000.
Hubele, Adolf: *See*—
Aebi, Rudolf; Hubele, Adolf; and Speich, Jurg, 4,940,799, Cl. 548-268.800.
Huc, Christian: *See*—
Hauton, Francois; Dumas, Frederic; Bouttemy, Franck; and Huc, Christian, 4,940,866, Cl. 219-10.55A.
Hughes Aircraft Company: *See*—
Hill, William H.; and Donner, Joseph E., 4,940,875, Cl. 219-89.000.
Kelley, Edwin A.; and Stone, Wade J., 4,941,153, Cl. 375-36.000.
Huguenin, George R., to Millitech Corporation. Millimeter wave locating. 4,940,986, Cl. 342-410.000.
Huhtamki Oy: *See*—
Lankinen, Tapio, 4,940,051, Cl. 128-200.180.
Hunt, Douglas J. Visual compact disk wall rack. 4,940,147, Cl. 211-40.000.
Hunter Contracting Company: *See*—
Templeton, Darrel L., 4,940,280, Cl. 296-190.000.
Hurley, Richard H.; and Funk, Cyril R., Jr., to Lofts, Inc. Plants having endophytio-fungus-enhanced performance and method of producing same. 4,940,834, Cl. 800-200.000.
Huss, Michael: *See*—
Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Pieter, Reimund, 4,940,784, Cl. 536-1.100.
Stober, Reinhard; Bischoff, Dietmar; and Huss, Michael, 4,940,785, Cl. 536-90.000.
Hyde, Jack, to North American Refractories Company. Checker brick. 4,940,081, Cl. 165-9.100.
Hydromatik GmbH: *See*—
Walzer, Winfried; and Sommer, Thomas, 4,939,954, Cl. 74-733.100.

Hyogo, Yukihiro; and Kurihara, Akio, to Yazaki Corporation. Connector device with fitting adjustment mechanism. 4,940,417, Cl. 439-248.000.
Hyundae Metal Co., Ltd.: *See*—
Kim, Won Se, 4,940,269, Cl. 292-337.000.
Ibach, Robert: *See*—
Fabianowski, Jan; and Ibach, Robert, 4,941,077, Cl. 363-49.000.
Ichihashi, Akira: *See*—
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Ichikoh Industries, Ltd.: *See*—
Yoshida, Norio, 4,940,321, Cl. 350-633.000.
Ichimura, Takashi; Takamatsu, Koji; Konuma, Takayuki; and Tsukui, Takaaki, to Honda Giken Kogyo Kabushiki Kaisha. Exhaust system for multi-cylinder internal combustion engines and method for controlling same. 4,939,898, Cl. 60-274.000.
ID Systems International B.V.: *See*—
De Nood, Cornelis S. A., 4,940,968, Cl. 340-572.000.
Ide, Motoki; and Sato, Toshifumi, to NEC Corporation. Radio pager receiver capable of readily checking whether or not memory backup is correct. 4,940,975, Cl. 340-825.440.
Idehara, Masami: *See*—
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.
Idemitsu Petrochemical Co., Ltd.: *See*—
Ashida, Takashi; and Yamamoto, Koji, 4,940,779, Cl. 528-495.000.
Iding, Stephen H.; and Dirksing, Robert S., to Procter & Gamble Company, The. Method of isolating a product in a passive dosing dispenser by trapping internally-generated gas bubble. 4,939,795, Cl. 4-228.000.
Igarashi, Kimio; Uchida, Yasuo; and Matsui, Kenji, to Omron Tateisi Electronics Co. Data processing method in recognition system. 4,941,181, Cl. 382-1.000.
Igarashi, Yasuo: *See*—
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Iida, Kazuyoshi: *See*—
Mizuno, Keiichiro; and Iida, Kazuyoshi, 4,940,914, Cl. 310-326.000.
Iijima, Hitoshi; and Nishimura, Kunio, to Showa Denko K. K. Method for granulation of enzyme. 4,940,665, Cl. 435-187.000.
Iiyama, Kiyotaka; and Hayakawa, Kunio, to Ricoh Company, Ltd. Coloring phthalide compounds and recording materials using the compounds as coloring component. 4,940,691, Cl. 503-220.000.
Iizuka, Akihiro, to Diado Metal Company Ltd. Method of manufacturing a bearing device including a housing with a flange at one end thereof and a bearing bush press-fitted thereinto. 4,939,827, Cl. 29-898.054.
Ijadi-Maghsoodi, Sina: *See*—
Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, 4,940,767, Cl. 528-35.000.
Ikawa, Kazuo: *See*—
Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.
Ikeda Bussan Co., Ltd.: *See*—
Sakamoto, Daishiro; Mouri, Takayuki; and Tamura, Hisao, 4,940,266, Cl. 292-227.000.
Ikeda, Hayato: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, to Canon Kabushiki Kaisha. Liquid jet recording head. 4,940,999, Cl. 346-140.00R.
Ikeda, Masamichi: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.
Ikejiri, Kenichi: *See*—
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Ikeuchi, Satoru: *See*—
Matsubara, Akitoshi; Ikeuchi, Satoru; Akimoto, Kunio; and Takizawa, Yoshio, 4,940,644, Cl. 430-109.000.
Ikeya, Jitsuo: *See*—
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Ikezawa, Ken: *See*—
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ILC Technology, Inc.: *See*—
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Imamura, Takayuki: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.
Imaseki, Takashi; and Kobari, Yuji, to Nissan Motor Co., Ltd. Integrated four-wheel steer and differential slip control system. 4,941,095, Cl. 364-424.050.
Immega, Guy; and Kukolj, Mirko. Axially contractable actuator. 4,939,982, Cl. 92-92.000.
Imoto, Masayuki: *See*—
Kawashima, Kazuki; Yasui, Makoto; Hayakawa, Hisashi; and Imoto, Masayuki, 4,940,447, Cl. 474-110.000.
Imperial Chemical Industries PLC: *See*—
Cunningham, Ian M.; and Heaton, David W., 4,940,788, Cl. 540-200.000.
Shadwell, David W.; and Joseph, Martin, 4,940,168, Cl. 222-153.000.
Inabata, Tatsuo, to Olympus Optical Co., Ltd. Finder optical system for cameras. 4,941,012, Cl. 354-478.000.
Inagaki, Jitsuo. Method of treating medical wastes and containers to be used for the treatment method. 4,940,157, Cl. 220-254.000.
Inagoya, Osamu: *See*—
Tottori, Takeshi; Fujiwara, Hideo; and Inagoya, Osamu, 4,941,064, Cl. 360-120.000.
Inaguma, Shoichi; Hasegawa, Masayuki; and Ichihashi, Akira, to Shachibata Industrial Co., Ltd. Multi-surfaced rotary stamping apparatus. 4,939,990, Cl. 101-109.000.
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., to Merck & Co., Inc. Novel HMG-CoA reductase inhibitors. 4,940,727, Cl. 514-450.000.
Inco Alloys International, Inc.: *See*—
Bates, Thomas O., 4,940,882, Cl. 219-146.220.
Industrial Technology Research Institute: *See*—
Lin, Cheng F., 4,940,904, Cl. 307-262.000.
Ingham, Scott W., to General Electric Company. Digital radio with security system for selectively enabling software controlled options. 4,941,174, Cl. 380-52.000.
Ingle, Gary D.: *See*—
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Ingress Technologies, Inc.: *See*—
Terwilliger, Richard A.; Hebert, Daniell; and Hall, Jack, 4,940,061, Cl. 128-754.000.
Innovation Sports, Inc.: *See*—
Castillo, James D., 4,940,044, Cl. 128-80.00C.
Inoue, Hideo: *See*—
Matunaga, Akira; Inoue, Hideo; Ikezawa, Ken; and Arai, Tetu, 4,939,811, Cl. 15-385.000.
Institut Francais du Petrole: *See*—
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Institut Pasteur: *See*—
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Institute of Technology Precision Electrical Discharge Works: *See*—
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International Business Machines Corporation: *See*—
Akers, Albert L.; Carpenter, Robert M.; Freeman, William D.; and Passafiume, John E., 4,940,348, Cl. 400-624.000.
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,941,120, Cl. 364-748.000.
Brown, Lawrence M.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; and Lawrence, William H., 4,940,651, Cl. 430-325.000.
Darnell, Michael J.; Hary, Joseph M.; and Quinn, Robert J., 4,941,102, Cl. 364-513.000.
Enescu, Michael A.; and Lum, James, 4,941,175, Cl. 380-4.000.
Fontana, Robert E., Jr.; Howard, James K.; Lee, James H.; and Lefakis, Haralambos, 4,940,511, Cl. 156-656.000.
Hilgers, Heinz; Morbitzer, Rainer; and Windeln, Johannes, 4,940,606, Cl. 427-130.000.
Kriz, Thomas A., 4,941,086, Cl. 364-200.000.
Krounbi, Mohamad T., 4,939,837, Cl. 29-603.000.
Kulakowski, John E.; Means, Rodney J.; Oldham, David M.; and Tayefeh, Morovat, 4,941,139, Cl. 369-54.000.
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.
Medan, Yoav, 4,941,152, Cl. 375-27.000.
Nihart, James D.; and Prabhakar, Samuel M., 4,941,115, Cl. 364-580.000.
International Flavors & Fragrances Inc.: *See*—
Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sudol, Marion A., 4,940,592, Cl. 426-94.000.
International Mobile Machines Corporation: *See*—
Garner, William J., 4,940,956, Cl. 333-209.000.
International Paper Company: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,940,612, Cl. 428-34.200.
International Sankoh Kabushiki Kaisha: *See*—
Watanabe, Harumi, 4,939,889, Cl. 53-450.000.
International Show Machine Corporation: *See*—
Walega, William, 4,939,805, Cl. 12-10.500.
International Business Corporation: *See*—
Abbiate, Jean-Claude; Blanc, Alain; Jeanniot, Patrick; and Lallemand, Eric, 4,941,151, Cl. 375-20.000.
Imai, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, to Toyota Jidosha Kabushiki Kaisha. Coupling structure for a rotating member and a shaft. 4,940,446, Cl. 474-91.000.
Ionics, Incorporated: *See*—
Goldstein, Arthur J.; and Parsi, Edgardo J., 4,940,667, Cl. 436-157.000.
Iowa State University Research Foundation, Inc.: *See*—
Barton, Thomas J.; and Ijadi-Maghsoodi, Sina, 4,940,767, Cl. 528-35.000.

Burnet, George; and Gokhale, Ashok J., 4,940,611, Cl. 428-2.000.
Johnson, Dennis C.; and Neuburger, Glen G., 4,939,924, Cl. 73-61.10C.

Ishibashi, Kiyotaka: *See*—
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Ishida, Nobuaki; Ishimura, Yoshifumi; and Murayama, Hiroshi, to Sega Enterprises, Ltd. Video game machine. 4,940,234, Cl. 273-1.0GA.

Ishida, Takashi; and Abe, Yasunao, to Yamaha Corporation. Automatic accompaniment apparatus. 4,939,974, Cl. 84-609.000.

Ishiguro, Fujio: *See*—
Oki, Shuichiro; and Ishiguro, Fujio, 4,940,528, Cl. 204-427.000.

Ishiguro, Takashi: *See*—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 4,940,618, Cl. 428-64.000.

Ishii, Kohji: *See*—
Ohmura, Atsuo; Koiso, Jun-ichi; Ishii, Kohji; and Nemoto, Mitsugu, 4,941,022, Cl. 355-298.000.

Ishii, Shigeru: *See*—
Asano, Hiroshi; and Ishii, Shigeru, 4,939,957, Cl. 74-866.000.

Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, to Director General of Fruit Tree Research Station Ministry of Agriculture, Forestry and Fisheries; and Kikkoman Corporation. Somatic hybrids of Rutaceae plants. 4,940,836, Cl. 800-220.000.

Ishikawa, Hiroshi: *See*—
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

Ishikawa, Hisashi: *See*—
Maeda, Takamasa; and Ishikawa, Hisashi, 4,941,207, Cl. 455-617.000.

Ishimizu, Hideaki: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; and Komori, Chihiro, 4,940,343, Cl. 400-124.000.

Ishimura, Yoshifumi: *See*—
Ishida, Nobuaki; Ishimura, Yoshifumi; and Murayama, Hiroshi, 4,940,234, Cl. 273-1.0GA.

Ishizuki, Toshio; Fukuda, Yoshio; and Honda, Ken-ichi, to Hitachi, Ltd.; and Hitachi Naka Electronics Co., Ltd. Electric capacitance strain gauge. 4,939,930, Cl. 73-780.000.

Isono, Kunihiro: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Istituto Guido Donegani S.p.A.: *See*—
Colle, Roberto; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,940,724, Cl. 514-397.000.

Itek Corporation: *See*—
Ealey, Mark A.; and Salemme, Victor G., 4,940,318, Cl. 350-611.000.

Iterated Systems, Inc.: *See*—
Barnsley, Michael F.; and Sloan, Alan D., 4,941,193, Cl. 382-56.000.

Ito, Hiroshi: *See*—
Umezu, Kenji; Ito, Hiroshi; and Ikeya, Jitsuo, 4,939,910, Cl. 62-160.000.

Ito, Kengo, to Sony Corporation. Display material. 4,940,689, Cl. 503-202.000.

Ito, Sadao: *See*—
Suzuki, Saburo; Nawa, Hiroshi; and Ito, Sadao, 4,940,285, Cl. 297-473.000.

Ito, Yasunobu; and Suzuki, Kenji, to Aisin-Warner Kabushiki Kaisha. Electronically controlled automatic transmission. 4,941,096, Cl. 364-424.100.

Itoh, Masahiro: *See*—
Takeda, Atsushi; Itoh, Masahiro; and Tsuchiya, Hiroaki, 4,941,003, Cl. 346-160.000.

Itoh, Masateru, to Mitsubishi Denki Kabushiki Kaisha. Command sensor in projection display apparatus. 4,941,036, Cl. 358-60.000.

Itoh, Yoshikazu; Hatakoshi, Makoto; and Sasaki, Mitsuru, to Sumitomo Chemical Company, Limited. Thiophosphoric acid ester as a soil pest controlling agent. 4,940,699, Cl. 514-114.000.

Itow, Hisao: *See*—
Aizawa, Motohiro; Ohsumi, Katsumi; Honda, Takashi; and Itow, Hisao, 4,940,564, Cl. 376-306.000.

Ittemann, Peter: *See*—
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.

Ivie, Craig R.: *See*—
Deane, John D.; Ivie, Craig R.; and Schumacher, Percy W., 4,940,099, Cl. 175-374.000.

Iwai, Takayuki: *See*—
Takeshita, Osamu; Iwai, Takayuki; and Terauchi, Kenichi, 4,940,217, Cl. 269-50.000.

Iwasa, Seizo: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Iwasaki, Kazuhiko: *See*—
Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, 4,941,085, Cl. 364-200.000.

Iwasaki, Tetsuji; and Uesaka, Toshio, to Kao Corporation. Antibiotic YI-HU3. 4,940,582, Cl. 424-115.000.

Iwasaki, Yoshiki, to Victor Company of Japan, Ltd. Spread spectrum communication system. 4,941,150, Cl. 375-1.000.

Izak, Ephraim: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.

Izubayashi, Masuji: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Izumi, Tetsuji: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

J. H. Jansen Company, Inc.: *See*—
Jansen, Johan H., 4,940,004, Cl. 110-182.500.

J. I. Case Company: *See*—
Heyne, Dennis J., 4,940,182, Cl. 237-12.30B.

J. M. Huber Corporation: *See*—
Harrison, John M. M., 4,940,534, Cl. 209-169.000.

J. Uriach & Cia, S.A.: *See*—
Bartroli, Javier; Anquita, Manuel; and Carceller, Elena, 4,940,706, Cl. 514-231.500.

Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., to Mobay Corporation. Process for the production of thiocarbohydrazide. 4,940,815, Cl. 564-18.000.

Jackson, David H., to Hoybond Limited. Decoy aircraft. 4,940,195, Cl. 244-1.00R.

Jackson, James G.: *See*—
Nyberg, Christopher A.; Jackson, James G.; and Brdicko, Jan, 4,941,134, Cl. 367-142.000.

Jackson, James R.; and Friskney, Stephen H., to White Consolidated Industries, Inc. Plastic dishwasher tub and support structure. 4,940,298, Cl. 312-228.000.

Jacobelli, Alain: *See*—
Coutellier, Jean-Marc; Jacobelli, Alain; Magna, Henriette; and Meunier, Paul-Louis, 4,939,835, Cl. 29-603.000.

Jacober, Jeffrey M., to SGI Inc. Backpack and insulated container. 4,940,173, Cl. 224-151.000.

Jacoby, Richard P. Post-operative bunion splint. 4,940,046, Cl. 128-81.00R.

Jaisinghani, Raian A.; and Bugli, Neville J., to American Filtrona Corporation. Single field ionizing electrically stimulated filter. 4,940,470, Cl. 55-2.000.

Jakobsen, Niels-Henrik G.: *See*—
Kyster, Erik; Jakobsen, Niels-Henrik G.; Molback, Jens J.; Stenderup, Ole; and Straede, Bjarne, 4,940,538, Cl. 210-137.000.

James River Corporation, The: *See*—
Rhodes, Wayne T., III; and Savaria, Normand M., 4,940,626, Cl. 428-198.000.

Janczak, Roger A.: *See*—
Kazlauskas, Vidas P.; Janczak, Roger A.; and Durley, Benton A., III, 4,940,527, Cl. 204-401.000.

Janian, Robert, to Tetrafluor, Inc. Method of making elastomeric embedded spring seal. 4,939,830, Cl. 29-173.000.

Jansen, Johan H., to J. H. Jansen Company, Inc. High energy combustion air nozzle and method for improving combustion in chemical recovery boilers. 4,940,004, Cl. 110-182.500.

Jansen van Rensburg, Johannes C. Golf club cleaner. 4,940,349, Cl. 401-10.000.

Janssen, Bernd: *See*—
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.

Janssen, Frank J.; Wilms, Coenraad H.; Reinalda, Donald; and Bruijn, Hendrik W., to Shell Oil Company. Catalyst system for olefin disproportionation. 4,940,827, Cl. 585-646.000.

Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., to Futura Coatings, Inc. Method for molding artificial urethane rock. 4,940,558, Cl. 264-46.700.

Jarboe, Rodney D.: *See*—
Jarboe, Enos D.; Jarboe, Rodney D.; and Barclay, Edward M., 4,940,558, Cl. 264-46.700.

Jasa, Paul B.: *See*—
Dinkha, Brian I.; Jasa, Paul B.; Seegmiller, Brian; and Simmons, Alden C., 4,939,996, Cl. 102-501.000.

Jass, Wieland, to Siemens Aktiengesellschaft. Method for reducing blocking artifacts in video scene coding with discrete cosine transformation (DCT) at a low data rate. 4,941,043, Cl. 358-133.000.

Jaubert, Philippe: *See*—
Castelain, Yves; Jaubert, Philippe; and Peltier, Rene , 4,940,382, Cl. 414-750.000.

JD-Technologie AG: *See*—
Feldmann, Hans-Ueli; and Heiz, Ueli, 4,940,378, Cl. 414-401.000.

Jeanniot, Patrick: *See*—
Abbiate, Jean-Claude; Blanc, Alain; Jeanniot, Patrick; and Lallemand, Eric, 4,941,151, Cl. 375-20.000.

Jeffrey, Frank R.: *See*—
Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank R.; Gilbert, James R.; and Aspen, Frank E., 4,940,495, Cl. 136-256.000.

Jenkins, Anthony W.; Leslie, Stewart T.; and Miller, Ronald B., to Euroceltique, S.A. Oral pharmaceutical composition through mucosa. 4,940,587, Cl. 424-480.000.

Jenkins, Maurice A., to Westinghouse Electric Corp. Fiber optic arc monitor. 4,940,933, Cl. 324-158.0MG.
Jenkins, Roland: *See*—
Cuba, Ronald R., Jr.; and Jenkins, Roland, 4,940,258, Cl. 283-81.000.
Jeong, Dong Kil, to Goldstar Co., Ltd. Data signal recording/reproduction apparatus of a VCR. 4,941,058, Cl. 360-67.000.
Jeromin, Lutz: *See*—
Gode, Peter; Riebe, Jens P.; and Jeromin, Lutz, 4,940,544, Cl. 210-603.000.
Jessee, Ralph D.: *See*—
Fox, David A.; and Jessee, Ralph D., 4,941,075, Cl. 363-41.000.
Jeyarajan, Arunachalam; Graham, Lawrence D.; Brokloff, John E.; and Monte, Louis H., to PCC Airfoils, Inc. Mold for casting a single crystal metal article. 4,940,073, Cl. 164-361.000.
Jian, Du. Universal handle. 4,940,230, Cl. 273-76.000.
Jiang, Ching-Lin, to Dallas Semiconductor Corporation. Temperature compensated monolithic delay circuit. 4,940,910, Cl. 307-591.000.
Jimena, Carlos L. Electric stapler having electronic control circuit. 4,940,177, Cl. 227-7.000.
John C. Garvin, Jr. & Harold W. Hilton: *See*—
Turner, Charles R., 4,939,986, Cl. 98-42.100.
John Fluke Mfg. Co., Inc.: *See*—
Nelson, Michael D.; Wong, Heimen; and Trana, Roger M., 4,940,204, Cl. 248-688.000.
John Sterling Corporation: *See*—
Kluge, Richard G., 4,939,866, Cl. 49-55.000.
Johnson, Acie G.: *See*—
Alexander, James R.; Johnson, Acie G.; and Prentice, Glenn W., 4,939,863, Cl. 42-103.000.
Johnson, Andrew J.; Petersen, Robert D.; and Swanson, Stephen D., to United States of America, Energy. Microwave heating apparatus and method. 4,940,865, Cl. 219-10.55A.
Johnson, Brian K. A.: *See*—
Patsiokas, Stelios J.; Moore, Morris A.; and Johnson, Brian K. A., 4,941,203, Cl. 455-53.000.
Johnson, Dennis C.; and Neuburger, Glen G., to Iowa State University Research Foundation, Inc. Pulsed coulometric detection with automatic rejection of background signal in surface-oxide catalyzed anodic detections at gold electrodes in flow-through cells. 4,939,924, Cl. 73-61.10C.
Johnson, Diana L. Infant measuring device. 4,939,849, Cl. 33-811.000.
Johnson, Donald B.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.
Johnson, Edward R.; Parandoosh, Ladan A.; and Lutz, Joseph F., to Peninsula Engineering Group, Inc. Communications repeater monitoring system. 4,941,198, Cl. 455-9.000.
Johnson, Jerry A. Three point hitch for truck. 4,940,096, Cl. 172-443.000.
Johnson, Kevin M., to Eastman Kodak Company. Photoconductive image receiving member with optimized light response characteristics. 4,941,016, Cl. 355-202.000.
Johnson, Michael A.: *See*—
Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., 4,940,331, Cl. 356-349.000.
Johnsson, Tommy M.: *See*—
Lindgren, Kent O.; Danielsson, Sven E.; Johnsson, Tommy M.; and Nilsson, Nils-Joel A., 4,940,503, Cl. 156-279.000.
Johnston, Geoffrey. Device to measure the tenderness of meat. 4,939,927, Cl. 73-81.000.
Jones, Gerald M., to GTE Products Corporation. True position gauge. 4,939,847, Cl. 33-545.000.
Jones, John H.: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.
Jones, Jonathan D. G.: *See*—
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Jones, Linda C.: *See*—
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Jones, Robin C.: *See*—
Peronek, Michael H.; and Jones, Robin C., 4,939,890, Cl. 53-486.000.
Jones, Todd K.; Mills, Sander G.; and Desmond, Richard, to Merck & Co., Inc. Process for synthesis of FK-506 C10–C18 intermediates. 4,940,797, Cl. 548-110.000.
Jordan, John W., III. Tank truck-storage vessel. 4,940,256, Cl. 280-837.000.
Jorgensen, Kurt G.: *See*—
Romer, Bendt W.; and Jorgensen, Kurt G., 4,939,952, Cl. 74-579.00E.
Joseph, Joseph P.: *See*—
Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, 4,940,710, Cl. 514-254.000.
Joseph, Martin: *See*—
Shadwell, David W.; and Joseph, Martin, 4,940,168, Cl. 222-153.000.
Joyce, Terrence H., to Minnesota Mining and Manufacturing Company. Method and system for enhancement of a digitized image. 4,941,190, Cl. 382-54.000.
JU-OH, Inc.: *See*—
Shibata, Istuo; and Fukahori, Osamu, 4,940,870, Cl. 219-10.491.
Judge, John L., to Magni Systems, Inc. Method of sampling color video signal having alternating phase characteristics. 4,941,035, Cl. 358-10.000.
Junge, Bodo: *See*—
Boshagen, Horst; Junge, Bodo; Paessens, Arnold; and Schuller, Matthias, 4,940,705, Cl. 514-227.800.
Jungheim, Louis N.: *See*—
Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., 4,940,718, Cl. 514-370.000.
Jursche, Kurt: *See*—
Ritter, Gerhard; Ritter, Klaus; Scherr, Rudolf; and Jursche, Kurt, 4,940,874, Cl. 219-87.000.
Juskey, Frank J., Jr.; Miles, Barry M.; and Suppelsa, Anthony B., to Motorola, Inc. Pad grid array for receiving a solder bumped chip carrier. 4,940,181, Cl. 228-180.200.
K G Engineering, Inc.: *See*—
Girvin, Robert H., 4,939,950, Cl. 74-551.200.
Kabushiki Kaisha Kobe Seiko Sho: *See*—
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.
Kabushiki Kaisha Tokai Rika Denki Seisakusho: *See*—
Hamamoto, Tadanao; Wakiya, Tadashi; and Hayasi, Kazunari, 4,940,322, Cl. 350-637.000.
Kabushiki Kaisha Toshiba: *See*—
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Hasebe, Kouki, 4,941,107, Cl. 364-518.000.
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Kumagai, Jumpei; and Fujii, Syuso, 4,941,031, Cl. 357-45.000.
Ohmine, Toshimitsu; Honda, Takaaki; and Akagawa, Keiiti, 4,940,213, Cl. 266-152.000.
Ono, Takuro; Aoyama, Noboru; and Morinaga, Kaoru, 4,941,140, Cl. 369-264.000.
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Shigyo, Naoyuki; and Sato, Koichi, 4,941,114, Cl. 364-578.000.
Tatsuno, Kyoichi, 4,940,326, Cl. 356-336.000.
Ueda, Katsunobu; Sumiya, Mitsuo; and Baba, Michio, 4,940,319, Cl. 350-613.000.
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Kabushiki Kaisha Toyota Chuo Kenkyusho: *See*—
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Kagawa, Takumi: *See*—
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Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, to NKK Corporation. Method for manufacturing plated steel sheet for cans. 4,940,522, Cl. 204-192.100.
Kagechika, Hiroshi: *See*—
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kageyama, Seiji: *See*—
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Kahn, Larry E.: *See*—
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Kaiser, Timothy D.: *See*—
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Kajita, Shunsuke: *See*—
Takenaka, Yasushi; Sugiyama, Takeshi; and Kajita, Shunsuke, 4,940,083, Cl. 165-42.000.
Kali-Chemie Aktiengesellschaft: *See*—
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Kaltz, Jeffrey L.: *See*—
Lebrun, Jean C.; Kaltz, Jeffrey L.; and Love, Pressley A., 4,940,499, Cl. 156-69.000.
Kamei, Hirotake, to Agency of Industrial Science & Technology, Ministry of Industrial Trade & Industry. Apparatus for measuring brain function using nuclear magnetic resonance. 4,940,057, Cl. 128-653.00A.
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, to Fuji Photo Film Co., Ltd. Photographic camera. 4,941,005, Cl. 354-195.100.
Kamioka, Toshihito: *See*—
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Kamp, Heinz: *See*—
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Kampmann, Detlef: *See*—
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Kanasaki, Morio: *See*—
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Kanegafuchi Kagaku Kogyo Kabushiki Kaisha: *See—*
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Kaneko, Kazuhiro, to Nihon Plast Co., Ltd. Impact absorbing structure for use in steering wheels and the like. 4,939,951, Cl. 74-552.000.

Kano, Hideki: *See—*
Aihara, Yasuyuki; Kano, Hideki; Tsuchiya, Yoshikazu; and Miyazaki, Noboru, 4,940,423, Cl. 439-369.000.

Kano, Kouji; Ogawa, Sumitaka; Sano, Minoru; and Sakano, Masahiro, to Molex Incorporated. Water-proof electrical connector. 4,940,421, Cl. 439-273.000.

Kant, Michel; Biedinger, Jean-Marie; Quessard, Roland; and Galko, Jacques, to Societe de Ventilation et d'Electricite Appliquees - Velecta; and Gradient. Brushless electric motor with self starting asymmetry. 4,940,912, Cl. 310-162.000.

Kao Corporation: *See—*
Hirota, Yoshitaka; Tanaka, Yukitaka; and Urata, Kouichi, 4,940,845, Cl. 435-134.000.
Iwasaki, Tetsuji; and Uesaka, Toshio, 4,940,582, Cl. 424-115.000.
Yoshihara, Toru; Kawase, Jiro; and Fukuyama, Yukihiro, 4,940,578, Cl. 424-70.000.

Kap, Mladen, to ASEA Aktiebolag. System for bumpless changeover between active units and backup units by establishing rollback points and logging write and read operations. 4,941,087, Cl. 364-200.000.

Kaplan, Carl, to Plough, Inc. Non-aqueous high SPF sunscreen oils. 4,940,574, Cl. 424-59.000.

Kaplinsky, Cecil H.: *See—*
Mulder, Theodor; and Kaplinsky, Cecil H., 4,940,909, Cl. 307-465.000.

Kaplinsky, George: *See—*
Hamlin, Mindy A.; and Kaplinsky, George, 4,940,997, Cl. 346-140.00R.

Karasawa, Takumi: *See—*
Yokosouchi, Teruo; Karasawa, Takumi; and Oono, Katuhisa, 4,940,439, Cl. 445-5.000.

Karbach, Stefan: *See—*
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.

Karger, Barry L.; and Nelson, Robert J., to Northeastern University. Window burner for polymer coated capillary columns. 4,940,883, Cl. 219-200.000.

Karl Otto Braun KG: *See—*
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, 4,940,047, Cl. 128-90.000.

Karlskind, Neil B.: *See—*
Wagaman, James P.; and Karlskind, Neil B., 4,940,416, Cl. 439-204.000.

Karne, Ramesh K.: *See—*
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Karnopp, Dean C.; and Yasui, Yoshiyuki, to Aisin Seiki Kabushiki Kaisha. Steering control methods and apparatus. 4,941,097, Cl. 364-424.050.

Kartridg Pak Co., The: *See—*
Steinke, Gary L., 4,939,885, Cl. 53-138.00A.

Kasahara, Hideo: *See—*
Okada, Ken-ichi; and Kasahara, Hideo, 4,940,753, Cl. 525-68.000.

Kasama, Yasuhiro: *See—*
Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, 4,941,129, Cl. 365-230.030.

Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, to Canon Kabushiki Kaisha. Developing device accommodating apparatus and image forming apparatus and developing device. 4,941,018, Cl. 355-245.000.

Kashiwada, Minoru: *See—*
Miwa, Harufumi; Kashiwada, Minoru; and Yahagi, Yoshimasa, 4,940,332, Cl. 356-417.000.

Kastl, Erna; Mathieu, Marion; and Goerres, Anton, to Hoechst Aktiengesellschaft. Tubular casing having an adhesive tape in the direction of its longitudinal axis. 4,940,614, Cl. 428-348.000.

Katagiri, Masayoshi: *See—*
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 4,940,119, Cl. 188-73.310.

Katayama, Aiichi; and Kon, Kenichi, to Anritsu Corporation. Digital waveform measuring apparatus having a shading-tone display function. 4,940,931, Cl. 324-121.00R.

Kato, Hisao, to Mitsubishi Denki Kabushiki Kaisha. Running type robot control system. 4,941,103, Cl. 364-513.000.

Kato, Minoru: *See—*
Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,940,642, Cl. 430-65.000.

Katsuyama, Kazuo, to Trinity Industrial Corporation. Automatic valve. 4,940,207, Cl. 251-65.000.

Katz, Beatriz E., to Alternative Energy Research Center Inc. Method and apparatus for displaying graphic and alphanumeric data. 4,940,973, Cl. 340-764.000.

Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, to Webcraft Technologies, Inc. Method for producing a mass distributable printed packet. 4,939,888, Cl. 53-411.000.

Kawabata, Koji: *See—*
Matsuba, Takao; Kubo, Masashige; Kagawa, Takumi; Oyama, Kiyotaka; and Kawabata, Koji, 4,940,802, Cl. 548-462.000.

Kawagishi, Shigemitsu; and Kita, Toshiyuki, to Okuno Chemical Industry Co., Ltd. Local electroless plating process for plastics. 4,940,608, Cl. 427-259.000.

Kawaguchi, Takao; Tamura, Tatsuhiko; and Takeda, Etsuya, to Matsushita Electric Industrial Co., Ltd. Method of electrically testing active matrix substrate. 4,940,934, Cl. 324-158.00R.

Kawahara, Eiichiro: *See—*
Furumoto, Mitsumasa; Kawahara, Eiichiro; Ikejiri, Kenichi; and Yamamoto, Noboru, 4,939,900, Cl. 60-456.000.

Kawai, Kiyoshi: *See—*
Sasaki, Toshio; Ebara, Takeshi; and Kawai, Kiyoshi, 4,940,682, Cl. 502-113.000.

Kawai, Masumi; and Sawada, Hiroshi, to Shimadzu Corporation. X-ray photographic equipment. 4,941,169, Cl. 378-99.000.

Kawai, Toru: *See—*
Fujimura, Shoji; and Kawai, Toru, 4,939,844, Cl. 33-12.000.

Kawakami, Yasushi: *See—*
Miki, Hiroyuki; and Kawakami, Yasushi, 4,940,275, Cl. 296-37.800.

Kawamura, Kiyoshi: *See—*
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, to Takara Shuzo Co., Ltd. Novel strains and their cultivation. 4,940,837, Cl. 800-200.000.

Kawasaki, Hisamitsu; Nakashima, Kunimichi; Araki, Kazunori; and Mizuno, Tsuyoshi, to Toyoda Koki Kabushiki Kaisha. Machine tool with tool change mechanism. 4,939,834, Cl. 29-568.000.

Kawasaki, Ikuya: *See—*
Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, 4,941,085, Cl. 364-200.000.

Kawasaki Jukogyo Kabushiki Kaisha: *See—*
Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, 4,940,488, Cl. 75-500.000.
Ueda, Yoshiteru, 4,940,100, Cl. 180-68.100.

Kawasaki, Masami, to Kubota Ltd. Gait type mower. 4,939,892, Cl. 56-11.100.

Kawasaki, Shinji: *See—*
Nemoto, Hiroshi; Umemoto, Koichi; and Kawasaki, Shinji, 4,940,960, Cl. 338-13.000.

Kawasaki, Yoshihiko: *See—*
Kikuchi, Shuichi; and Kawasaki, Yoshihiko, 4,940,127, Cl. 198-350.000.

Kawase, Jiro: *See—*
Yoshihara, Toru; Kawase, Jiro; and Fukuyama, Yukihiro, 4,940,578, Cl. 424-70.000.

Kawashima, Hiroyuki: *See—*
Motoe, Hisafumi; Kawashima, Hiroyuki; and Tokuhara, Masaharu, 4,941,046, Cl. 358-167.000.

Kawashima, Kazuki; Yasui, Makoto; Hayakawa, Hisashi; and Imoto, Masayuki, to NTN Toyo Bearing Co., Ltd. Autotensioner for adjusting the tension of a timing belt. 4,940,447, Cl. 474-110.000.

Kawata, Yutaka: *See—*
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Kawate, Yoshio: *See—*
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Kazlauskas, Vidas P.; Janczak, Roger A.; and Durley, Benton A., III, to Abbott Laboratories. Two-part test cartridge for centrifuge. 4,940,527, Cl. 204-401.000.

Kcl Corporation: *See—*
Edelman, Paul F.; and Nulliner, Cynthia M., 4,941,196, Cl. 383-5.000.

Kee, Heu-Tae, to SamSung Electronics Co., Ltd. Incomplete combustion preventing gas burner. 4,940,406, Cl. 431-22.000.

Keeler, Michael J.: *See—*
Abott, Richard A.; Ringe, Stephen J.; and Keeler, Michael J., 4,940,279, Cl. 296-181.000.

Kegasa, Koyo, to Mitsubishi Denki Kabushiki Kaisha. Phase and frequency comparator circuit for phase locked loop. 4,940,952, Cl. 331-11.000.

Keithley, Howard W., Jr. Shape adaptable protective cushion device and method of making and using same. 4,940,009, Cl. 114-343.000.

Kelley, Edwin A.; and Stone, Wade J., to Hughes Aircraft Company. High-speed digital data communication system. 4,941,153, Cl. 375-36.000.

Kelley, James L., to Burroughs Wellcome Co. Substituted glutamic acids. 4,940,713, Cl. 514-272.000.

Kelly, Gordon E.: *See—*
Hartson, Ted E.; and Kelly, Gordon E., 4,941,048, Cl. 358-181.000.

Kelly, John T. Pulse combustion driven in-furnace NOx and SO2 control system for furnaces and boilers. 4,940,405, Cl. 431-1.000.

Kelly, Joseph J., Jr., to U.S. Telecom International Inc. System for the recognition of automated telephone answering devices and delivery of prerecorded messages to such devices. 4,941,168, Cl. 379-69.000.

Kelterborn, Jeffrey C.: *See*—
Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderbold, James L., 4,940,530, Cl. 208-89.000.

Kemeny, Francis L.: *See*—
Sommerville, Iain D.; and Kemeny, Francis L., 4,940,486, Cl. 75-10.190.

Kemp Development Corporation: *See*—
Kemp, Willard E., 4,940,208, Cl. 251-315.000.

Kemp, Willard E., to Kemp Development Corporation. Ball valve. 4,940,208, Cl. 251-315.000.

Kempken, Rainer: *See*—
Grund, Gerhard; and Kempken, Rainer, 4,939,966, Cl. 82-165.000.

Kennametal Inc.: *See*—
Stiffler, Stephen P.; and Beach, Wayne H., 4,940,288, Cl. 299-79.000.

Kent-Moore Corporation: *See*—
Manz, Kenneth W., 4,939,905, Cl. 62-77.000.

Kenyon, Keith E. Pulfrich illusion turntable. 4,941,041, Cl. 358-89.000.

Keplinger, Klaus; Wagner, Hildebert; and Kreutzkamp, Barbara, to Keplinger, Klaus. Oxindole alkaloids having properties stimulating the immunologic system and preparation containing the same. 4,940,725, Cl. 514-411.000.

Kereszturi, Geza: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.

Kernforschungszentrum Karlsruhe GmbH: *See*—
Ohlmeyer, Manfred; and Benzel, Martin, 4,940,567, Cl. 422-173.000.

Key, James C.: *See*—
Honeycutt, LeRoy, III; Key, James C.; and Moody, Herbert, III, 4,940,077, Cl. 164-463.000.

Khait, Alexandr L.; Glagovsky, Boris A.; Frenkel, Larisa R.; and Los, Vera S. Apparatus with inductive loop synchronized oscillators for measuring the magnetic content of non-metallic samples. 4,940,939, Cl. 324-236.000.

Khan, Abbas A.: *See*—
Warrington, Richard E.; Khan, Abbas A.; and Merril, Carl R., 4,940,659, Cl. 435-7.000.

Kharadly, Mostafa Z.; and Siu, Fredrick W. C., to University of British Columbia. Intrabuilding wireless communication system. 4,940,990, Cl. 343-773.000.

Kida, Yasushi, to Sumitomo Electric Industries, Ltd. Frame erasing method for token ring networks without last frame indication within the frame format. 4,941,142, Cl. 370-85.500.

Kieffer, Kenneth D.: *See*—
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tschang, Pin S.; and Zeise, Eric K., 4,941,004, Cl. 346-160.000.

Kiel, Wolfgang; and Ziemann, Heinz, to Bayer Aktiengesellschaft. Process for the hydrogenation of α,β-unsaturated ketones. 4,940,819, Cl. 568-318.000.

Kiesling, Douglas A., to Brunswick Corporation. Marine propulsion unit universal drive assembly with through-bellows exhaust. 4,940,434, Cl. 440-57.000.

Kikkoman Corporation: *See*—
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.

Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; and Komori, Chihiro, to OKI Electric Industry Co., Ltd. Wire-dot print head driving apparatus. 4,940,343, Cl. 400-124.000.

Kikuchi, Kazuto: *See*—
Shimizu, Shigemi; Kikuchi, Kazuto; and Terauchi, Kiyoshi, 4,940,396, Cl. 417-410.000.

Kikuchi, Koji, to Seikosha Co., Ltd. Timepiece with mobile decorations. 4,941,137, Cl. 368-223.000.

Kikuchi, Shuichi; and Kawasaki, Yoshihiko, to Murata Kikai Kabushiki Kaisha. Wound yarn package transporting system. 4,940,127, Cl. 198-350.000.

Kikukawa, Shingo, to Kabushiki Kaisha Toshiba. Method of effectively performing a feed operation and printing apparatus for realizing the method. 4,941,109, Cl. 364-519.000.

Kilhefner, Paul T., III: *See*—
Pellman, Mark A.; Kilhefner, Paul T., III; and Hahn, Terrence S., 4,940,072, Cl. 164-35.000.

Kilstrom, Lars G.: *See*—
Larsson, Anders E. C.; Svanberg, Joakim A.; Kilstrom, Lars G.; and Tuvin, Lars G., 4,940,474, Cl. 55-210.000.

Kilthau, Gerhard; Spies, Karl H.; Vogt, Rolf; Freilaender, Peter; and Seethaler, Toni, to Carl Freudenberg, Firma. Seal for a magnetizable shaft. 4,940,248, Cl. 277-80.000.

Kim, Won Se, to Hyundae Metal Co., Ltd. Extension unit for door lock. 4,940,269, Cl. 292-337.000.

Kim, Yong I. Fluid ball applicator with vent tube. 4,940,350, Cl. 401-209.000.

Kimberly-Clark Corporation: *See*—
Van Gompel, Paul T.; Suprise, Jody D.; and Schleinz, Robert J., 4,940,464, Cl. 604-396.000.

Kimura, Akiyoshi: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Kimura, Kaoru, to Hashmoto Forming Industry Co., Ltd. Method of manufacturing molding members. 4,940,557, Cl. 264-26.000.

King Jim Co., Ltd.: *See*—
Osono, Katuo; and Maejima, Masaaki, 4,940,353, Cl. 402-79.000.

Kinoshita, Takeshi: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Kinzer, Norbert: *See*—
Rohe, Karl-Heinz; Sauerwein, Kurt; Weinlich, Karl; Link, Rainer; and Kinzer, Norbert, 4,940,452, Cl. 600-7.000.

Kinzli, Lee A. Electrical enclosure wrench. 4,939,960, Cl. 81-124.400.

Kircherer, Robert; and Schreder, Felix, to E.G.O. Elektro-Gerate Blanc u. Fischer. Electric hotplate. 4,940,886, Cl. 219-457.000.

Kirchgeorg, John; and Hermann, Michael G., to Kirchgeorg, John. Gas dispensing apparatus and case therefor. 4,940,049, Cl. 128-205.240.

Kishida, Satoru, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor integrated circuit device. 4,941,033, Cl. 357-75.000.

Kishimoto, Mitsuharu: *See*—
Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, 4,940,488, Cl. 75-500.000.

Kissei Pharmaceutical Co., Ltd.: *See*—
Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,940,715, Cl. 514-293.000.

Kissel, William R.: *See*—
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.

Kita, Toshiyuki: *See*—
Kawagishi, Shigemitsu; and Kita, Toshiyuki, 4,940,608, Cl. 427-259.000.

Kita, Yuutaro: *See*—
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.

Kitagawa, Yoshinori: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Kitayama, Tadayoshi; Matsushita, Kiwami; and Motoshima, Kuniaki, to Mitsubishi Denki Kabushiki Kaisha. Star network optical transmission system. 4,940,306, Cl. 350-96.160.

Kittler, Wilfred C., Jr.; Czukor, Janos; and Stoddard, Darrell, to Andus Corporation. Thin film artwork compounds. 4,940,627, Cl. 428-203.000.

Kittrell, James M.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,940,612, Cl. 428-34.200.

Kitz Corporation: *See*—
Watanabe, Masaharu; and Monzen, Takashi, 4,940,562, Cl. 264-234.000.

Kizaki, Masatoshi: *See*—
Yokoyama, Hitoshi; Sano, Hiroyuki; Horimoto, Akiko; and Kizaki, Masatoshi, 4,940,600, Cl. 426-582.000.

Klauber, Robert D.; and Vigmostad, Erik B., to SensorTech, L. P. Magnetostrictive torque sensor. 4,939,937, Cl. 73-862.360.

Klaus, Michael; Mohr, Peter; and Weiss, Ekkehard, to Hoffman-La Roche Inc. Stilbene derivatives for treatment of skin disorders. 4,940,707, Cl. 514-237.800.

Kleiber, Herbert, to 501 Standard Elektrik Lorenz AG. Transmitting station for a navigation system comprising a main transmitter and a stand-by transmitter, particularly transmitting station for the MLS microwave landing system. 4,940,984, Cl. 342-173.000.

Klein, Hermann-Josef: *See*—
Heim, Hans; and Klein, Hermann-Josef, 4,940,034, Cl. 123-497.000.

Klein, Joseph T.: *See*—
Effland, Richard C.; and Klein, Joseph T., 4,940,704, Cl. 514-211.000.

Klein, Milton L. Sock pairer and holder. 4,939,823, Cl. 24-590.000.

Klingel, Hans; and Doettling, Juergen, to Trumpf GmbH & Co. Combination punch press and laser cutting machine with laser beam generator mounted thereon. 4,940,880, Cl. 219-121.670.

Klosterhalfen, Hartwig: *See*—
Wittkopp, Helmut; Kluge, Gerhardt; and Klosterhalfen, Hartwig, 4,939,962, Cl. 82-1.110.

Klug, Gunter; Buysch, Hans-Josef; and Puppe, Lothar, to Bayer Aktiengesellschaft. Process for the preparation of n-alkylanilines. 4,940,817, Cl. 564-305.000.

Kluge, Gerhardt: *See*—
Wittkopp, Helmut; Kluge, Gerhardt; and Klosterhalfen, Hartwig, 4,939,962, Cl. 82-1.110.

Kluge, Richard G., to John Sterling Corporation. Window guard assembly. 4,939,866, Cl. 49-55.000.

Knauf, Marvin C., to Steelcase, Inc. Quick mounting arrangement for light fixtures in overhead cabinets and the like. 4,941,071, Cl. 362-133.000.

Kneen, Clare O.: *See*—
Baker, Raymond; Kneen, Clare O.; Saunders, John; and Swain, Christopher, 4,940,703, Cl. 514-210.000.

Kneib, Rudi: *See*—
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, 4,939,899, Cl. 60-412.000.

Kniep, Claus: *See*—
Weber, Jurgen; Kampmann, Detlef; Thonnessen, Franz; and Kniep, Claus, 4,940,818, Cl. 564-471.000.

Knoll, Manfred: *See*—
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.

Knopp, Axel: *See*—
Hoaan, Hans-Josef; and Knopp, Axel, 4,940,202, Cl. 248-162.100.

Kobari, Yuji: *See*—
Imaseki, Takashi; and Kobari, Yuji, 4,941,095, Cl. 364-424.050.

Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, to Kabushiki Kaisha Kobe Seiko Sho. Plasma reactor for diamond synthesis. 4,940,015, Cl. 118-723.000.

Kobayashi, Atsuhito: *See*—
Ono, Shoichi; and Kobayashi, Atsuhito, 4,940,889, Cl. 250-214.00R.

Kobayashi, Kenichi, to NEC Corporation. Semiconductor laser device. 4,941,146, Cl. 372-45.000.

Kobayashi, Kenji; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, to Kanegafuchi Kagaku Kogyo Kabushiki Kaisha. Semiconductor device. 4,941,032, Cl. 357-67.000.

Kobayashi, Shozo: *See*—
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.

Kobayashi, Tohru; Hamamoto, Masato; and Yamada, Toshio, to Hitachi, Ltd. ECL flip-flop with improved α-ray resistant properties. 4,940,905, Cl. 307-278.000.

Kobayashi, Yoshiaki: *See*—
Honda, Takao; and Kobayashi, Yoshiaki, 4,941,019, Cl. 355-251.000.

Kober, Hermann: *See*—
Grape, Wolfgang; Schlak, Ottfried; de Montigny, Armand; and Kober, Hermann, 4,940,743, Cl. 524-377.000.

Kober, Jurgen; and Brandenstein, Manfred, to SKF GmbH. Braking device for drive belts. 4,940,448, Cl. 474-111.000.

Kober, Reiner: *See*—
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.

Koboshi, Shigeharu: *See*—
Aoki, Syozo; Kuse, Satoru; and Koboshi, Shigeharu, 4,940,134, Cl. 202-202.000.
Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; Naoi, Masayuki; and Fujisawa, Yasuhiro, 4,941,006, Cl. 354-299.000.

Koch, Horst: *See*—
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 4,940,650, Cl. 430-283.000.

Koerner, Christopher: *See*—
Bohley, Thomas K.; Garnett, Grosvenor H.; Koerner, Christopher; and Moore, Charles E., 4,940,979, Cl. 341-152.000.

Koga, Masao: *See*—
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,940,657, Cl. 430-578.000.

Koiso, Jun-ichi: *See*—
Ohmura, Atsuo; Koiso, Jun-ichi; Ishii, Kohji; and Nemoto, Mitsugu, 4,941,022, Cl. 355-298.000.

Kojima, Hideki: *See*—
Nakaji, Nobuo; Kojima, Hideki; and Tachibana, Ryoichi, 4,940,337, Cl. 366-148.000.

Kolm, Peter: *See*—
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.

Kolton, Chester; and Spater, Stuart S., to B & G Plastics, Inc. Hanger and display arrangement for suspenders. 4,940,146, Cl. 211-13.000.

Kolts, John H.: *See*—
Tooley, Patricia A.; and Kolts, John H., 4,940,686, Cl. 502-327.000.

Komai, Hiroshi; and Aoki, Hideo, to Ricoh Company, Ltd. Device for screening a photoconductive element unit from external light. 4,941,015, Cl. 355-200.000.

Komatsu Dresser Company: *See*—
Galuska, Raymond D.; and Murawski, Charles S., 4,940,124, Cl. 192-70.280.

Komatsu, Katsumi: *See*—
Sakuma, Hajime; Sasaki, Toshiyuki; and Komatsu, Katsumi, 4,939,925, Cl. 73-61.400.

Komatsu, Nobuhiro, to Mazda Motor Corporation. Front body structure of vehicle. 4,940,281, Cl. 296-194.000.

Komatsu, Nobuo: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.

Komori, Chihiro: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; and Komori, Chihiro, 4,940,343, Cl. 400-124.000.

Kon, Kenichi: *See*—
Katayama, Aiichi; and Kon, Kenichi, 4,940,931, Cl. 324-121.00R.

Kondo, Koichi: *See*—
Wakamatsu, Kaori; Kondo, Koichi; and Sudo, Katsuichi, 4,940,730, Cl. 514-560.000.

Kondo, Masataka: *See*—
Kobayashi, Kenji; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,941,032, Cl. 357-67.000.

Kondo, Toshihito: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, to Aisin Seiki Kabushiki Kaisha. Disc brake assembly. 4,940,119, Cl. 188-73.310.

Kone Elevator GmbH: *See*—
Ovaska, Seppo, 4,940,117, Cl. 187-101.000.

Konica Corporation: *See*—
Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; Naoi, Masayuki; and Fujisawa, Yasuhiro, 4,941,006, Cl. 354-299.000.
Nagasaki, Satoru, 4,940,652, Cl. 430-403.000.
Ohmura, Atsuo; Koiso, Jun-ichi; Ishii, Kohji; and Nemoto, Mitsugu, 4,941,022, Cl. 355-298.000.
Yoshida, Makoto, 4,941,009, Cl. 354-402.000.

Konishi, Hiroshi: *See*—
Shimizu, Makoto; and Konishi, Hiroshi, 4,940,418, Cl. 439-260.000.

Konishi, Masaaki, to Nissan Motor Co., Ltd. Auxiliary visor. 4,940,273, Cl. 296-97.600.

Konishiroku Photo Industry Co., Ltd.: *See*—
Aoki, Syozo; Kuse, Satoru; and Koboshi, Shigeharu, 4,940,134, Cl. 202-202.000.
Matsubara, Akitoshi; Ikeuchi, Satoru; Akimoto, Kunio; and Takizawa, Yoshio, 4,940,644, Cl. 430-109.000.

Konisi, Kazuo: *See*—
Yamazaki, Mituo; and Konisi, Kazuo, 4,941,118, Cl. 364-761.000.

Konno, Makoto: *See*—
Teshima, Takeo; and Konno, Makoto, 4,941,104, Cl. 364-474.300.

Kono, Michitoshi: *See*—
Maki, Toshio; Miura, Chiyoshi; and Kono, Michitoshi, 4,939,829, Cl. 29-159.200.

Konopka, April A.: *See*—
Gorton, Lanny A.; Pelmulder, John P.; Konopka, April A.; and Bloom, William G., 4,940,399, Cl. 417-415.000.

Konose, Yoshiomi, to Mitsubishi Pencil Co., Ltd. Liquid applicator with movable supply tube. 4,940,351, Cl. 401-278.000.

Konuma, Takayuki: *See*—
Ichimura, Takashi; Takamatsu, Koji; Konuma, Takayuki; and Tsukui, Takaaki, 4,939,898, Cl. 60-274.000.

Konya, Minehiro: *See*—
Tanaka, Hideaki; Morita, Toshiaki; and Konya, Minehiro, 4,941,195, Cl. 382-61.000.

Kopin Corporation: *See*—
Zavracky, Paul M., 4,940,672, Cl. 437-132.000.

Korbonits, Dezso: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Kormoczi, Peter: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Kotani, Hiroaki: *See*—
Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, 4,941,129, Cl. 365-230.030.

Kowarsch, Heinrich; and Dix, Johannes P., to BASF Aktiengesellschaft. Colorant mixtures containing isoquinoline derivatives, use thereof in printing inks, and novel isoquinoline derivatives. 4,940,492, Cl. 106-494.000.

Koyama, Hideo: *See*—
Maki, Kazuya; Koyama, Hideo; and Suzuta, Takeo, 4,939,981, Cl. 91-166.000.

Koyo Seiko Co., Ltd.: *See*—
Toyoshima, Hiromitsu; Yoneda, Hirokazu; Ueno, Hiroshi; and Hatabu, Shoji, 4,939,947, Cl. 74-422.000.

Kraft General Foods, Inc.: *See*—
Sabhlok, Jatinder P.; Horan, William J.; and Carlton, Donna K., 4,940,591, Cl. 426-94.000.

Kratzert, Herbert; and Schrem, Kurt, to Kratzert & Schrem GmbH. Binding folder. 4,940,352, Cl. 402-13.000.

Kratzert & Schrem GmbH: *See*—
Kratzert, Herbert; and Schrem, Kurt, 4,940,352, Cl. 402-13.000.

Krause, Detlev: *See*—
Wirz, Arno; and Krause, Detlev, 4,940,221, Cl. 271-107.000.

Krause, Helmut: *See*—
Schmidt, Bodo; and Krause, Helmut, 4,940,120, Cl. 188-73.360.

Krause, Ronald O., to MEI Services, Inc. Device for use with self-adhesive removable labels. 4,940,506, Cl. 156-584.000.

Krebs, David J., to Albany International Corp. Imbedded mesh in suction box cover. 4,940,515, Cl. 162-363.000.

Kress, Gerhard, to BASF Aktiengesellschaft. Blowing agent masterbatch for the preparation of polystyrene foams. 4,940,735, Cl. 521-86.000.

Kretschmann, Bernd; and Wandel, Dietmar, to Davy McKee Aktiengesellschaft. Process for the production of uniform POY filaments. 4,940,559, Cl. 264-130.000.

Kreutzkamp, Barbara: *See*—
Keplinger, Klaus; Wagner, Hildebert; and Kreutzkamp, Barbara, 4,940,725, Cl. 514-411.000.

Kridl, Thomas A.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; Triplett, James T.; and Wille, Marc, 4,940,820, Cl. 428-34.900.

Krieger, Friedrich, to Noell GmbH. Apparatus for recognizing and approaching a three-dimensional target. 4,941,106, Cl. 364-513.000.

Kriehn, Hartmut: *See*—
Berges, Hanns-Peter; Kriehn, Hartmut; Leier, Wolfgang; and Steffens, Ralf, 4,940,398, Cl. 417-410.000.

Kriz, Thomas A., to International Business Machines Corporation. Program controlled bus arbitration for a distributed array processing system. 4,941,086, Cl. 364-200.000.

Kroener, Michael: *See*—
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Weberndoerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, 4,940,514, Cl. 162-168.200.

Kromrey, Robert V., to United Technologies Corporation. Molding method and apparatus using a solid flowable, polymer medium. 4,940,563, Cl. 264-257.000.

Kroontje, Wiggert; and van den Bogert, Willem J., to U.S. Philips Corporation. Electrodeless low-pressure discharge lamp. 4,940,923, Cl. 315-248.000.

Kroumbi, Mohamad T., to International Business Machines Corporation. Batch fabrication process for magnetic heads. 4,939,837, Cl. 29-603.000.

Kruse, Kenneth E.: *See*—
Van Duyn, Phillip L.; Barenwald, Jorg R.; and Kruse, Kenneth E., 4,940,359, Cl. 405-118.000.

Kubin, Peter Z.; and Stepan, Jiri E., to Ogden-Martin Systems, Inc. Acid gas control process and apparatus for waste fired incinerators. 4,940,010, Cl. 110-233.000.

Kubo, Masashige: *See*—
Matsuba, Takao; Kubo, Masashige; Kagawa, Takumi; Oyama, Kiyotaka; and Kawabata, Koji, 4,940,802, Cl. 548-462.000.

Kubo, Seitoku: *See*—
Inui, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, 4,940,446, Cl. 474-91.000.

Kubon, Achim; and Ehlert, Klaus-Peter, to Mannesmann AG. Start-up head for horizontally continuous casting. 4,940,075, Cl. 164-446.000.

Kubota Ltd.: *See*—
Kawasaki, Masami, 4,939,892, Cl. 56-11.100.

Kuchuk-Yatsenko, Sergei I.; Bogorsky, Mikhail V.; Belyaev, Daniil I.; Bondaruk, Andrei V.; and Goronkov, Nikolai D. Method of flash-butt resistance welding of a batch of like parts in pairs. 4,940,876, Cl. 219-110.000.

Kuczynski, Joseph P.: *See*—
Brown, Lawrence M.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; and Lawrence, William H., 4,940,651, Cl. 430-325.000.

Kudo, Hiroaki: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Kudo, Hiroaki, 4,941,148, Cl. 372-96.000.

Kuepper, Wilhelm; and Kamp, Heinz, to W. Schlafhorst & Co. Package transport apparatus for a textile machine. 4,940,192, Cl. 242-35.50A.

Kuhlen, Ernst, to Pierburg GmbH. Fuel pump having a pressure chamber vented via a ball valve to the fuel tank. 4,940,397, Cl. 417-435.000.

Kukes, Simon G.; Hensley, Albert L., Jr.; Kelterborn, Jeffrey C.; and Aderhold, James L., to Amoco Corporation. Two-stage hydrocarbon conversion process. 4,940,530, Cl. 208-89.000.

Kukolj, Mirko: *See*—
Immega, Guy; and Kukolj, Mirko, 4,939,982, Cl. 92-92.000.

Kulakowski, John E.; Means, Rodney J.; Oldham, David M.; and Tayefeh, Morovat, to International Business Machines Corporation. Checking media operations and recording during optical recording. 4,941,139, Cl. 369-54.000.

Kumagai, Jumpei; and Fujii, Syuso, to Kabushiki Kaisha Toshiba. Dynamic memory device with improved wiring layer layout. 4,941,031, Cl. 357-45.000.

Kumagai, Kazuo: *See*—
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Kumar, Shalabh; and Edgar, Duane S., to Microfast Controls Corp. Interrupt zone in rung of ladder program in programmable controller. 4,941,081, Cl. 364-140.000.

Kummer Freres Sa Fabrique De Machines: *See*—
Leiber, Hans-Jurgen, 4,939,963, Cl. 82-19.000.

Kunz, Alfred: *See*—
List, Heinz, deceased; Schwenk, Walther; and Kunz, Alfred, 4,941,130, Cl. 366-99.000.

Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Santangelo, Joseph G., to Air Products and Chemicals, Inc. Method for foaming high temperature polymers using poly(alkylene carbonates) as foaming agents. 4,940,733, Cl. 521-79.000.

Kurahashi, Kazuyoshi: *See*—
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Youji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, 4,939,867, Cl. 49-349.000.

Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, to Nihon Tokushu Noyaku Seizo K.K. Fungicidal 2-(3-pyridyl)-1,3-dioxanes. 4,940,483, Cl. 71-94.000.

Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, to Kissei Pharmaceutical Co., Ltd. 5H-pyrazolo[4,3-A] quinolizin-5-one compounds exhibiting therapeutic activities. 4,940,715, Cl. 514-293.000.

Kurematsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; Naoi, Masayuki; and Fujisawa, Yasuhiro, to Konica Corporation. Automatic processor. 4,941,006, Cl. 354-299.000.

Kurihara, Akio: *See*—
Hyogo, Yukihiro; and Kurihara, Akio, 4,940,417, Cl. 439-248.000.

Kurita, Kaoru; and Nishio, Yukio, to Yazaki Corporation. Electrical junction box. 4,940,419, Cl. 439-271.000.

Kuroyanagi, Akiko: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.

Kurschatke, Wolfgang: *See*—
Driesen, Manfred; Kurschatke, Wolfgang; and Kutz, Johannes, 4,939,914, Cl. 68-22.00R.

Kurth, Orville. Yard plastic bag holder. 4,940,201, Cl. 248-101.000.

Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, to BASF Aktiengesellschaft. Preparation of recording layers and their use for the production of flexographic printing plates. 4,940,650, Cl. 430-283.000.

Kusakabe, Katsuhiko: *See*—
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.

Kuse, Satoru: *See*—
Aoki, Syozo; Kuse, Satoru; and Koboshi, Shigeharu, 4,940,134, Cl. 202-202.000.

Kusher, J. Leon: *See*—
Williams, Charles E.; and Kusher, J. Leon, 4,940,590, Cl. 426-92.000.

Kushino, Mitsuo: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Kusuhara, Teturo: *See*—
Satuka, , Yoshihiko; and Kusuhara, Teturo, 4,939,832, Cl. 29-281.400.

Kusumoto, Toshihiko: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Kutz, Johannes: *See*—
Driesen, Manfred; Kurschatke, Wolfgang; and Kutz, Johannes, 4,939,914, Cl. 68-22.00R.

Kuwana, Kazutaka: *See*—
Adachi, Yoshiharu; Kuwana, Kazutaka; and Yoshida, Tsuyoshi, 4,940,295, Cl. 303-117.000.

Kuzmick, Kenneth M.: *See*—
Santilli, Albert N.; and Kuzmick, Kenneth M., 4,940,066, Cl. 128-882.000.

Kwack, Tae H., to Mobil Oil Corporation. Lightweight tenter frame clip. 4,939,825, Cl. 26-93.000.

Kwon, Chul-Hoon: *See*—
Nagasawa, Herbert T.; and Kwon, Chul-Hoon, 4,940,816, Cl. 564-103.000.

Kyster, Erik; Jakobsen, Niels-Henrik G.; Molback, Jens J.; Stenderup, Ole; and Straede, Bjarne, to Danfoss A/S. Apparatus for decalcifing water by producing turbulence. 4,940,538, Cl. 210-137.000.

Lace, Melvin A.: *See*—
McCartney, Thomas; and Lace, Melvin A., 4,941,063, Cl. 361-119.000.

Lademann, Diethart: *See*—
Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, 4,940,653, Cl. 430-502.000.

Lafayette Instrument Co., Inc.: *See*—
Voelz, Michael H., 4,940,059, Cl. 128-688.000.

Lafer, Percival. Sofa-bed. 4,939,802, Cl. 5-37.00C.

Lallemand, Eric: *See*—
Abbiate, Jean-Claude; Blanc, Alain; Jeanniot, Patrick; and Lallemand, Eric, 4,941,151, Cl. 375-20.000.

Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, to Agfa-Gevaert Aktiengesellschaft. Multilayered color photographic material having an alkali soluble interlayer. 4,940,653, Cl. 430-502.000.

Lamberg, John R., to Honeywell Inc. Millimeter wave microstrip IMPATT diode oscillator. 4,940,953, Cl. 331-96.000.

Lambert, Didier C., to BP Oil International Limited. Method and apparatus for determining the flocculation threshold of a petroleum product. 4,940,900, Cl. 250-343.000.

Landi, Ernest D., to Avantek, Inc. High efficiency high isolation amplifier. 4,940,949, Cl. 330-262.000.

Landry, Bernard: *See*—
Lesquir, Dominique; and Landry, Bernard, 4,940,268, Cl. 292-317.000.

Lang, Gerard: *See*—
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 4,940,765, Cl. 528-15.000.

Lang, Karl U.: *See*—
Aquino, Agostino; and Lang, Karl U., 4,940,130, Cl. 198-432.000.

Langen, Gunter: *See*—
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, 4,940,047, Cl. 128-90.000.

Langenberg, Werner, to Gewerkschaft Eisenhutte Westfalia GmbH. Planetary overriding gearing and overriding driving for chain belts

and the like, particularly for chain conveyors and chaindrawn mining machines. 4,939,949, Cl. 475-2.000.

Langley, John: *See*—
Flesher, Peter; Farrar, David; Hawe, Malcolm; and Langley, John, 4,940,763, Cl. 526-307.000.

Lanham, Robert L.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,940,612, Cl. 428-34.200.

Lankinen, Tapio, to Huhtamki Oy. Inhalation device. 4,940,051, Cl. 128-200.180.

Lanxide Technology Company, LP: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; and White, Danny R., 4,940,679, Cl. 501-96.000.

Lanzisera, Vincent: *See*—
Olshansky, Robert; and Lanzisera, Vincent, 4,941,208, Cl. 455-618.000.

Lardellier, Alain M. J., to Societe Nationale d'Etude et de Construction de Moteurs d'Aviation S.N.E.C.M.A. Wing mounting nacelle for a very high by-pass ratio turbojet aero-engine. 4,940,196, Cl. 244-54.000.

Larsen, Robert D.: *See*—
Corley, Edward G.; Larsen, Robert D.; Grabowski, Edward J. J.; and Reider, Paul, 4,940,813, Cl. 560-103.000.

Larsson, Anders E. C.; Svanberg, Joakim A.; Kilstrom, Lars G.; and Tuvin, Lars G., to Aktiebolaget Electrolux. Suction cleaner. 4,940,474, Cl. 55-210.000.

Last, Harry J. Leading edge and track slider system for an automatic swimming pool cover. 4,939,798, Cl. 4-502.000.

Laswell, William L.: *See*—
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,520, Cl. 204-157.710.

Lau, Philip T. S.; and Thompson, Danny R., to Eastman Kodak Company. 5-substituted aminophenols. 4,940,812, Cl. 560-12.000.

Lau, Wan F.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lau, Wan F., 4,940,700, Cl. 514-167.000.

Lauchenauer, Max: *See*—
Abend, Thomas; and Lauchenauer, Max, 4,940,748, Cl. 524-521.000.

Laude, David P., to Ford Motor Company. Precision CMOS comparator with hysteresis. 4,940,907, Cl. 307-359.000.

Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W., to Cookson Laminox Limited. Process for preparing an iron oxide. 4,940,572, Cl. 423-633.000.

Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, to BASF Aktiengesellschaft. Glass fiber reinforced flameproofed thermoplastic molding compositions based on polyesters and graft polymers. 4,940,745, Cl. 524-504.000.

Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, to BASF Aktiengesellschaft. Glass fiber reinforced thermoplastic molding compositions based on polyesters and graft polymers. 4,940,746, Cl. 524-504.000.

Lawrence, William H.: *See*—
Brown, Lawrence M.; Gelorme, Jeffrey D.; Kuczynski, Joseph P.; and Lawrence, William H., 4,940,651, Cl. 430-325.000.

Laws, Peter G.; and Fletcher, Graham J., to Plessey Overseas Limited. Clock driven data sampling circuit. 4,940,948, Cl. 329-307.000.

Lazenby, James E. Storage cabinet. 4,940,299, Cl. 312-285.000.

Le, An V.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Leady, Scott C. Adjustable game call device. 4,940,451, Cl. 446-208.000.

Leathers, Sherman; and Williamson, Geronimo C. Disposable combined panty with sanitary napkin. 4,940,463, Cl. 604-396.000.

Leavitt, Edward J., Jr.: *See*—
Leavitt, Edward J., Sr.; and Leavitt, Edward J., Jr., 4,940,622, Cl. 428-137.000.

Leavitt, Edward J., Sr.; and Leavitt, Edward J., Jr. Image bearing sign affixed to a window. 4,940,622, Cl. 428-137.000.

Lebrun, Jean C.; Kaltz, Jeffrey L.; and Love, Pressley A., to Warner-Lambert Company. Method and apparatus for sealing capsules containing medicaments. 4,940,499, Cl. 156-69.000.

Ledru, Roger: *See*—
Thuries, Edmond; Pham, Van Doan; and Ledru, Roger, 4,940,961, Cl. 338-21.000.

Lee, Clark J. Reversible wrench. 4,939,961, Cl. 81-60.000.

Lee, James H.: *See*—
Fontana, Robert E., Jr.; Howard, James K.; Lee, James H.; and Lefakis, Haralambos, 4,940,511, Cl. 156-656.000.

Lee, Jong D., to Namsung Electronics Corp. Antitheft car audio set with removable control box. 4,940,414, Cl. 439-131.000.

Lee, Kap J.: *See*—
Niki, Etsuko; Niki, Motohiro; Lee, Kap J.; Niki, Misako; and Niki, Mieko, 4,940,017, Cl. 119-18.000.

Lee, Roy C.: *See*—
Drake, Charles A.; Parrish, William R.; and Lee, Roy C., 4,940,833, Cl. 585-868.000.

Lee, Ta J.: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.

Lee, Tocew. Systematic equipments for recycling raw materials from waste wires. 4,940,187, Cl. 241-79.100.

Lefakis, Haralambos: *See*—
Fontana, Robert E., Jr.; Howard, James K.; Lee, James H.; and Lefakis, Haralambos, 4,940,511, Cl. 156-656.000.

Lefkowitz, Sheldon: *See*—
Trovato, Stephen A.; Lefkowitz, Sheldon; and Eckert, Robert J., 4,940,289, Cl. 299-37.000.

Legrand: *See*—
Baillet, Alain; Loisel, Francois; and Paulin, Daniel, 4,940,163, Cl. 221-193.000.

Lehnbeck, Donald R.; Triplett, Roger L.; and Marks, Kevin E., to Xerox Corporation. Digital image proofing. 4,941,057, Cl. 358-443.000.

Leiber, Hans-Jurgen, to Kummer Freres Sa Fabrique De Machines. Fixture for precision turning of a lateral surface. 4,939,963, Cl. 82-19.000.

Leier, Wolfgang: *See*—
Berges, Hanns-Peter; Krieln, Hartmut; Leier, Wolfgang; and Steffens, Ralf, 4,940,398, Cl. 417-410.000.

Leifeld, Ferdinand, to Trutzschler GmbH & Co. KG. Lap evening apparatus for a fiber processing machine. 4,939,815, Cl. 019-105.000.

Leising, Maurice B.: *See*—
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.

Lemke, Ronald D.: *See*—
Randall, James E.; Lemke, Ronald D.; and Mesteller, Robert A., 4,940,040, Cl. 126-21.00A.

Ler , John M., III: *See*—
norn, Darrell C.; and Lennox, John M., III, 4,941,132, Cl. 366-278.000.

Lensmire, Todd T.; Donald, Robert J.; Turley, Sheldon G.; and Tallmadge, Bruce J., to Dow Chemical Company, The. Easily colored thermoplastic molding composition. 4,940,754, Cl. 525-80.000.

Leonardi, Amedeo: *See*—
Nardi, Dante; Leonardi, Amedeo; Catto, Alberto; and Graziani, Gabriele, 4,940,711, Cl. 514-255.000.

Leonardi, Giovanni M., to RCA Licensing Corporation. Synchronized switch-mode power supply. 4,941,078, Cl. 363-97.000.

Leonovich, George A., Jr. Combination portable cooler with audio receiver and portable cooler with audio system. 4,939,912, Cl. 62-457.100.

LePere, Willard. Truck cab-bed unit window seal assembly. 4,940,278, Cl. 296-166.000.

Leroux, Patrick, to General Electric CGR SA. Method of radio-frequency excitation in an NMR experiment. 4,940,940, Cl. 324-309.000.

Leslie, Samuel A.; and Gordon, Robert T., to Orion Industries, Inc. Booster. 4,941,200, Cl. 455-17.000.

Leslie, Stewart T.: *See*—
Jenkins, Anthony W.; Leslie, Stewart T.; and Miller, Ronald B., 4,940,587, Cl. 424-480.000.

Lesquir, Dominique; and Landry, Bernard. Tamper-proof tag. 4,940,268, Cl. 292-317.000.

Lessar, Joseph F.: *See*—
Taylor, William J.; Weiss, Douglas; and Lessar, Joseph F., 4,940,858, Cl. 174-152.0GM.

Lessi, Jacques; and Tholance, Michel, to Institut Francais du Petrole. Method and device to actuate specialized intervention equipment in a drilled well having at least one section highly slanted with respect to a vertical line. 4,940,094, Cl. 166-373.000.

Levine, Robert A.: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,940,668, Cl. 436-174.000.

Lewis, David H.: *See*—
Bartuska, Victor J.; and Lewis, David H., 4,940,942, Cl. 324-321.000.

Lewis, Fielding H., Jr.: *See*—
Tucker, Richard B. C.; Davis, Jackie L.; and Lewis, Fielding H., Jr., 4,940,243, Cl. 273-326.000.

Ley, David A.; Hiscock, Laura J.; and Cooke, Michael T., to American Cyanamid. Process for the preparation of porous polymer beads. 4,940,734, Cl. 521-84.100.

Leybold Aktiengesellschaft: *See*—
Berges, Hanns-Peter; Krieln, Hartmut; Leier, Wolfgang; and Steffens, Ralf, 4,940,398, Cl. 417-410.000.
Schuetz, Guenter; and Schwartz, Joerg, 4,940,341, Cl. 384-465.000.

Leyser, Willy: *See*—
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, 4,940,047, Cl. 128-90.000.

L'Heureux, Ghislain. Method of acoustically insulating a toilet bowl. 4,940,113, Cl. 181-296.000.

Liberty Pool Products S.A.: *See*—
Supra, Carl F. W., 4,939,806, Cl. 15-1.700.

Licinvest AG: *See*—
Ackeret, Peter, 4,939,860, Cl. 40-513.000.

Lien, Neil C.; and Olsen, Donald G., to Baker Manufacturing Company. Seating arrangement and structure of a spool within a well casing. 4,940,087, Cl. 166-88.000.

Lilienfeld, Pedro, to TRC Companies Inc. Method and apparatus for real time asbestos aerosol monitoring. 4,940,327, Cl. 356-338.000.

Liljenquist, Don C. Keyboard assembly and typing method. 4,940,346, Cl. 400-487.000.

Lilleker, Jonathan R.; Henshaw, Harry; and Winter, John L., to Rolls-Royce plc. Cooling of turbine blades. 4,940,388, Cl. 416-97.00R.

Limitorque Corporation: *See—*
Wilkerson, Ivan E.; and Auxier, Robert W., 4,940,011, Cl. 116-277.000.

Lin, Cheng F., to Industrial Technology Research Institute. Output circuit for producing positive and negative pulses at a single output terminal. 4,940,904, Cl. 307-262.000.

Lin, Chuan-Fu: *See—*
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.

Lin, Jiang-Jen: *See—*
Speranza, George P.; and Lin, Jiang-Jen, 4,940,770, Cl. 528-111.000.

Lin, Nan J.; and Hanley, Peter G., to Gillette Company, The. Erasable system including marking surface and erasable ink composition. 4,940,628, Cl. 428-207.000.

Lin, Tzong-Shyan. Nursing bottle. 4,940,152, Cl. 215-11.500.

Lin, Yang-I: *See—*
Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, 4,940,710, Cl. 514-254.000.

Linde Aktiengesellschaft: *See—*
Weber, Guenter, 4,939,817, Cl. 23-308.00S.

Lindenbaum, John: *See—*
Allen, Robert H.; Stabler, Sally P.; and Lindenbaum, John, 4,940,658, Cl. 435-4.000.

Lindgren, Kent O.; Danielsson, Sven E.; Johnsson, Tommy M.; and Nilsson, Nils-Joel A., to Prestorp AB. Process for the production of an abrasion resistant decorative thermosetting laminate. 4,940,503, Cl. 156-279.000.

Lindner, Christian: *See—*
Eichenauer, Herbert; Lindner, Christian; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,940,747, Cl. 524-504.000.
Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, 4,940,755, Cl. 525-90.000.

Lindsay, Michael R.: *See—*
Carle, Keith B.; Glowczewski, Thomas; Holbrook, Gerald L.; Kissel, William R.; Leising, Maurice B.; and Lindsay, Michael R., 4,939,928, Cl. 73-118.100.

Link, Rainer: *See—*
Rohe, Karl-Heinz; Sauerwein, Kurt; Weinlich, Karl; Link, Rainer; and Kinzer, Norbert, 4,940,452, Cl. 600-7.000.

Lipinski, Reinhard. Fluid pressure operated positioning apparatus. 4,939,983, Cl. 92-62.000.

Lipo Chemicals Inc.: *See—*
Greenberg, Stephen M.; and Frischling, Louis A., 4,940,577, Cl. 424-59.000.

Lisak, Stephen P.: *See—*
Ryder, Francis E.; and Lisak, Stephen P., 4,939,945, Cl. 74-89.130.

List AG: *See—*
List, Heinz, deceased; Schwenk, Walther; and Kunz, Alfred, 4,941,130, Cl. 366-99.000.

List, Heinz, deceased (by List, Jorg, executor); Schwenk, Walther; and Kunz, Alfred, to List AG. Multi-spindle kneading mixer with fixed kneading counterelements. 4,941,130, Cl. 366-99.000.

List, Jorg, executor: *See—*
List, Heinz, deceased; Schwenk, Walther; and Kunz, Alfred, 4,941,130, Cl. 366-99.000.

Littlejohn, Douglas J.; and Fellows, Richard L., to Biologix Inc. Interface circuit for use in a portable blood chemistry measuring apparatus. 4,940,945, Cl. 324-438.000.

Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, to Beijing Research Institute of Chemical Industry; and Lummus Crest, Inc. Catalyst and process for hydrogenation of unsaturated hydrocarbons. 4,940,687, Cl. 502-333.000.

Livigni, Didier: *See—*
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, 4,941,112, Cl. 364-527.000.

Lo, Lawrence Y.; and Boulier, Paul R., to Polysar Financial Services S.A. Styrenic polycarbonate alloys. 4,940,752, Cl. 525-67.000.

Lo, Shui-Yin, to Apricot S.A. Method and apparatus for forming coherent clusters. 4,940,893, Cl. 250-251.000.

Lockwood Graders (U.K.) Limited: *See—*
Cowlin, Simon; Clark, Leslie J.; Dennis, Timothy J.; and Gunawardena, Charith A., 4,940,536, Cl. 209-592.000.

Loctite Corporation: *See—*
Muisener, Charles M., 4,940,537, Cl. 210-96.100.

Lofts, Inc.: *See—*
Hurley, Richard H.; and Funk, Cyril R., Jr., 4,940,834, Cl. 800-200.000.

Loisel, Francois: *See—*
Baillet, Alain; Loisel, Francois; and Paulin, Daniel, 4,940,163, Cl. 221-193.000.

Lok, Brent M.: *See—*
Flanigen, Edith M.; Lok, Brent M.; Patton, Robert L.; and Wilson, Stephen T., 4,940,570, Cl. 423-306.000.

Loken, Michael R.: *See—*
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,940,668, Cl. 436-174.000.

Lokken, Clayton A.: *See—*
Gruenewald, Bryan E.; and Lokken, Clayton A., 4,939,916, Cl. 70-373.000.

Lomas, Trevor A.: *See—*
Font Freide, Joseph J.; Howard, Mark J.; and Lomas, Trevor A., 4,940,826, Cl. 585-600.000.

L'Oreal: *See—*
Sebag, Henri; and Vanlerberghe, Guy, 4,940,573, Cl. 424-45.000.

Loredo-Murphy, Jorge: *See—*
Martinez-Soto, Alfredo; Loredo-Murphy, Jorge; and Becerril-Ortega, Benito, 4,940,480, Cl. 65-356.000.

Lorenz, Gisela: *See—*
Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, 4,940,717, Cl. 514-341.000.

Lorenzi, Silvana: *See—*
della Valle, Francesco; Romeo, Aurelio; and Lorenzi, Silvana, 4,940,694, Cl. 514-25.000.

Los, Vera S.: *See—*
Khait, Alexandr L.; Glagovsky, Boris A.; Frenkel, Larisa R.; and Los, Vera S., 4,940,939, Cl. 324-236.000.

Love, Pressley A.: *See—*
Lebrun, Jean C.; Kaltz, Jeffrey L.; and Love, Pressley A., 4,940,499, Cl. 156-69.000.

Lu, Ching-Nan. Door having a frame in which a sliding piece is mounted. 4,939,868, Cl. 49-388.000.

Lucas Industries Public Limited Co.: *See—*
Bishop, Frederick J.; Cooper, David T.; and Hill, William H., 4,939,978, Cl. 89-33.140.
Foster, David, 4,940,294, Cl. 303-115.000.

Ludwig, Paul N.: *See—*
Shamouilian, Shamouil; and Ludwig, Paul N., 4,940,508, Cl. 156-643.000.

Lue, Tom F.: *See—*
Tanagho, Emil A.; Schmidt, Richard A.; Gleason, Curtis A.; and Lue, Tom F., 4,940,065, Cl. 128-784.000.

Lugscheider, Walter; and Pochmarski, Luzian, to Voest-Alpine Stahl Donawitz Gesellschaft m.b.H. Process for utilizing of zinc-containing metallurgical dusts and sludges. 4,940,487, Cl. 75-384.000.

Luijk, Pieter: *See—*
Broekhuis, Antonius A.; Luijk, Pieter; and Stamhuis, Jan E., 4,940,756, Cl. 525-237.000.

Lum, James: *See—*
Enescu, Michael A.; and Lum, James, 4,941,175, Cl. 380-4.000.

LumiTech International, L.P.: *See—*
Helling, James C.; Beckrot, Anders W.; and Murray, Scott V., 4,940,921, Cl. 315-219.000.

Lummus Crest, Inc.: *See—*
Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, 4,940,687, Cl. 502-333.000.

Lund Company: *See—*
Lund, William J., 4,940,347, Cl. 400-621.100.

Lund, William J., to Lund Company. Paper tractor feed separator. 4,940,347, Cl. 400-621.100.

Lundqvist, Ragnar: *See—*
Hiltunen, Matti; Lundqvist, Ragnar; and Sarkki, Juha, 4,940,007, Cl. 110-347.000.

Lundy Electronics & Systems, Inc.: *See—*
Britt, Ronald H., 4,941,189, Cl. 382-46.000.

Lurssen, Klaus: *See—*
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Froh-berger, Paul-Ernst, 4,940,798, Cl. 548-268.400.

Luscombe, Brian M.: *See—*
Hewett, Richard H.; and Luscombe, Brian M., 4,940,484, Cl. 71-94.000.

Lussier, Roger J., to W. R. Grace & Co.-Conn. Catalytic cracking process employing an acid-reacted metakaolin catalyst. 4,940,531, Cl. 208-120.000.

Luthra, Narender P.: *See—*
Braatz, James A.; Heifetz, Aaron H.; Wolfe, Richard A.; and Luthra, Narender P., 4,940,737, Cl. 521-103.000.

Lutz, Joseph F.: *See—*
Johnson, Edward R.; Parandoosh, Ladan A.; and Lutz, Joseph F., 4,941,198, Cl. 455-9.000.

Luxenburger, Gerd, to MTU Motoren- Und Turbinen-Union Munich GmbH. Assembly of rotor blades in a rotor disc for a compressor or a turbine. 4,940,389, Cl. 416-193.00A.

Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Co., Inc. Process for the preparation of 4-acyloxyazetidin-2-one by singlet oxygen oxidation. 4,940,520, Cl. 204-157.710.

M. W. Kellogg Company, The: *See—*
Petterson, William C.; Wells, Thomas A.; Cherish, Peter; and Morgan, Stephen W., 4,940,828, Cl. 585-652.000.

Mabe, Atsushi: *See—*
Yamamoto, Tamaki; and Mabe, Atsushi, 4,940,395, Cl. 417-310.000.

MacDiarmid, Alan G., to University of Pennsylvania. High capacity polyaniline electrodes. 4,940,640, Cl. 429-213.000.

MacFarlane, Calum B.; Selkirk. Alastair B.; and Dey, Michael J., to Syntex (U.S.A.) Inc. Method of preparing long acting formulation. 4,940,556, Cl. 264-15.000.

Machold, Timothy R.: *See—*
Hampton, Hilary J.; Gaiser, John W.; Taylor, Charles S.; and Machold, Timothy R., 4,940,062, Cl. 128-772.000.

MacKay, Duncan R.: *See—*
Cellucci, Robert; MacKay, Duncan R.; and Madden, Allan C., 4,939,941, Cl. 73-865.800.

Madden, Allan C.: *See—*
Cellucci, Robert; MacKay, Duncan R.; and Madden, Allan C., 4,939,941, Cl. 73-865.800.

Madison, Bryan L.: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Madison, Donald. Car cover. 4,940,276, Cl. 296-136.000.

Maeda, Takamasa; and Ishikawa, Hisashi, to Nihon Musen Kabushiki Kaisha. Structure for wireless communication in an electromagnetically shielded building. 4,941,207, Cl. 455-617.000.

Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, to Kawasaki Jukogyo Kabushiki Kaisha. Method of smelting reduction of ores containing metal oxides. 4,940,488, Cl. 75-500.000.

Maeda, Toshihiko: *See*—
Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, 4,940,851, Cl. 501-56.000.

Maeda, Yasunori: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Maejima, Masaaki: *See*—
Osono, Katuo; and Maejima, Masaaki, 4,940,353, Cl. 402-79.000.

Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, to Oki Electric Industry Co., Ltd. Paper feed device and paper cassette therefor. 4,940,222, Cl. 271-127.000.

Magadini, John A., to Ten Pro Corporation. Bat with reverse conical grip. 4,940,247, Cl. 273-72.00A.

Magna, Henriette: *See*—
Coutellier, Jean-Marc; Jacobelli, Alain; Magna, Henriette; and Meunier, Paul-Louis, 4,939,835, Cl. 29-603.000.

Magni Systems, Inc.: *See*—
Judge, John L., 4,941,035, Cl. 358-10.000.

Mahan, John E., to Colorado State University Research Foundation. Semiconducting metal silicide radiation detectors. 4,940,898, Cl. 250-338.400.

Maier, Mark C.: *See*—
Fuller, Robert L., Jr.; Faville, Paul E.; and Maier, Mark C., 4,940,128, Cl. 198-395.000.

Maier, Peter. Method of producing stiffening profiles, particularly of reduced weight. 4,939,828, Cl. 29-897.200.

Majumdar, Gourab, to Mitsubishi Denki Kabushiki Kaisha. Semiconductor device. 4,941,030, Cl. 357-43.000.

Maki, Kazuya; Koyama, Hideo; and Suzuta, Takeo, to Honda Giken Kogyo Kabushiki Kaisha. Hydraulic servo cylinder device for controlling continuously variable speed transmission. 4,939,981, Cl. 91-166.000.

Maki, Toshio; Miura, Chiyoshi; and Kono, Michitoshi, to Honda Giken Kogyo Kabushiki Kaisha. Method of and apparatus for manufacturing a gear. 4,939,829, Cl. 29-159.200.

Makino, Hideaki: *See*—
Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, 4,940,778, Cl. 528-481.000.

Makino, Reiji: *See*—
Horiki, Seinosuke; and Makino, Reiji, 4,940,624, Cl. 428-159.000.

Malata, Peter: *See*—
Apap, Marc F. C.; Thorin, Cedric L. M. C.; Rosenstatter, Otto; and Malata, Peter, 4,940,410, Cl. 433-102.000.

Maletic, Victor A. Texturing device for wet concrete. 4,940,358, Cl. 404-93.000.

Mallinckrodt, Inc.: *See*—
Noce, Louis O., 4,940,459, Cl. 604-98.000.

Malsch, Klaus-Dieter: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Mandell, Douglas E., to Dolby Laboratories Licensing Corporation. Adaptive-filter single-bit digital encoder and decoder and adaptation control circuit responsive to bit-stream loading. 4,940,977, Cl. 341-143.000.

Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., to Dolby Laboratories Licensing Corporation. Variable matrix decoder. 4,941,177, Cl. 381-22.000.

Mandell, Gerald D. Vehicular kennel for pets. 4,939,911, Cl. 62-239.000.

Maney, Jerry R.: *See*—
Coveney, Leila D.; Jones, Linda C.; and Maney, Jerry R., 4,940,695, Cl. 514-57.000.

Mank, Richard M.: *See*—
Dampier, Frederick W.; and Mank, Richard M., 4,940,605, Cl. 427-77.000.

Mann, Arnold, to VDO Adolf Schindling AG. Setting device for a feed device of an internal combustion engine. 4,940,031, Cl. 123-339.000.

Mann, Brian M.; and Poore, John W., to Siemens-Pacesetter, Inc. Microprocessor controlled rate-responsive pacemaker having automatic rate response threshold adjustment. 4,940,052, Cl. 128-419.0PG.

Mann, Brian M.; and Poore, John W., to Siemens-Pacesetter, Inc. Energy controlled rate-responsive pacemaker having automatically adjustable control parameters. 4,940,053, Cl. 128-419.0PG.

Mannesmann AG: *See*—
Kubon, Achim; and Ehlert, Klaus-Peter, 4,940,075, Cl. 164-446.000.

Mansfield, Daniel I., to Rank Taylor Hobson. Imaging apparatus. 4,940,895, Cl. 250-332.000.

Mantani, Rokurota: *See*—
Taguchi, Hanzo; Mantani, Rokurota; Murayama, Masatosi; and Nishino, Toshihiro, 4,939,969, Cl. 84-719.000.

Manz, Kenneth W., to Kent-Moore Corporation. Recovery system for differing refrigerants. 4,939,905, Cl. 62-77.000.

Marangoni, Roy D., to University of Pittsburgh. Method and apparatus for measuring dynamic bearing force. 4,941,105, Cl. 364-506.000.

Marano, Gerald A.: *See*—
Gibbons, Charles E.; Marano, Gerald A.; Kittrell, James M.; Whillock, Allan A.; Lanham, Robert L.; and Evans, Donald, 4,940,612, Cl. 428-34.200.

Marcu, Mihail I. Propulsion system and process for pneumatic pipeline transport. 4,940,368, Cl. 406-79.000.

Marcus, Ilan, to Du Pont de Nemours, E. I., and Company. Relating to bonded non-woven polyester fiber structures. 4,940,502, Cl. 156-272.200.

Maresca, Louis M., to General Electric Company. Reactive polycarbonate end capped with hydroxy phenyl oxazoline. 4,940,771, Cl. 528-199.000.

Margaret Platt Borgen: *See*—
Borgen, Arden L., 4,940,297, Cl. 312-138.100.

Mariani, Elio A.; and Skudera, William J., Jr., to United States of America, Army. Saw slanted array correlator (SAC) with separate amplitude compensation channel. 4,941,133, Cl. 367-140.000.

Marianneau, Michel E. A.: *See*—
Aebi, Gilbert; Raye, Pierre; David, Maurice J. A.; and Marianneau, Michel E. A., 4,940,369, Cl. 407-42.000.

Marion Laboratories, Inc.: *See*—
Duff, Steven R., 4,940,786, Cl. 536-117.000.

Marks, Kevin E.: *See*—
Lehmbeck, Donald R.; Triplett, Roger L.; and Marks, Kevin E., 4,941,057, Cl. 358-443.000.

Marmarosi, Katalin: *See*—
Hermecz, Istvan; Keresztari, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.

Marmarosi nee Keliner, Katalin: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Marshall, John; Raven, Anthony L.; Welford, Walter T.; and Ness, Karen M. M., to Summit Technology, Inc. Surface erosion using lasers. 4,941,093, Cl. 364-413.010.

Martell, Trevor J. Thermally stable diamond abrasive compact body. 4,940,180, Cl. 228-122.000.

Martens, Jean B. O. S., to U.S. Philips Corporation. Television transmission system including a hybrid encoding circuit. 4,941,042, Cl. 358-133.000.

Martin, Diane D., to Aluminum Company of America. Oil ring for casting. 4,940,078, Cl. 164-472.000.

Martin, Georges: *See*—
Horvath, Laszlo; Martin, Georges; and Schween, Heiner, 4,940,000, Cl. 104-295.000.

Martin, Harvey: *See*—
Amra, Lutfi H.; Byrne, Thomas M., Jr.; Martin, Harvey; Mordue, George S.; and Neff, David V., 4,940,384, Cl. 415-121.200.

Martin, Jay K.: *See*—
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.

Martin, John C.: *See*—
Ballyns, Jan; Martin, John C.; and Martin, Paul H., 4,940,380, Cl. 414-495.000.

Martin, Linda. Method for playing a board game. 4,940,235, Cl. 273-236.000.

Martin, Paul H.: *See*—
Ballyns, Jan; Martin, John C.; and Martin, Paul H., 4,940,380, Cl. 414-495.000.

Martinez-Soto, Alfredo; Loredo-Murphy, Jorge; and Becerril-Ortega, Benito, to Vitro Tec Fideicomiso. Molding cooling system for the manufacture of glass articles or similar materials. 4,940,480, Cl. 65-356.000.

Martini, Leo A. Fluid powered rotary percussion drill with formation disintegration inserts. 4,940,097, Cl. 175-296.000.

Maruyama, Hitoshi: *See*—
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.

Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, to Seiko Epson Corporation. Page printer. 4,941,002, Cl. 346-160.000.

Marvell, Michael D.; and Milliser, John S., to Textron Inc. Clinch type fastener structure and tooling. 4,940,375, Cl. 411-181.000.

Masaoka, Tuyoshi: *See*—
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.

Mase, Hiroshi: *See*—
Ushida, Yoshihisa; Hirai, Nobuki; and Mase, Hiroshi, 4,940,681, Cl. 501-134.000.

Mason, James M.; and Pifer, David D., to University of Tennessee Research Corporation, The. Platelet cryopreservation. 4,940,581, Cl. 424-532.000.

Mason, Steven M.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; and White, Danny R., 4,940,679, Cl. 501-96.000.
Massmann, Volker; and Poetsch, Dieter, to Robert Bosch GmbH. Method and apparatus for concealing errors which extend over several pixels in a digital video signal. 4,941,186, Cl. 382-54.000.
Masumoto, Tsuyoshi: *See*—
Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, 4,940,851, Cl. 501-56.000.
Mathias, Lon J.; and Cei, Gustavo, to University of Southern Mississippi, The. 2,6-substituted-4-aminopyridines and their corresponding intermediates. 4,940,796, Cl. 546-323.000.
Mathieu, Marion: *See*—
Kastl, Erna; Mathieu, Marion; and Goerres, Anton, 4,940,614, Cl. 428-348.000.
Matsuba, Takao; Kubo, Masashige; Kagawa, Takumi; Oyama, Kiyotaka; and Kawabata, Koji, to Tosoh Corporation. 4,4'-bis(phthalimido)diphenyl sulfone compounds, processes for their production and flame retardant polymer compositions containing them. 4,940,802, Cl. 548-462.000.
Matsubara, Akitoshi; Ikeuchi, Satoru; Akimoto, Kunio; and Takizawa, Yoshio, to Konishiroku Photo Industry Co., Ltd. Toner for development of electrostatic images and image forming method by use thereof. 4,940,644, Cl. 430-109.000.
Matsuda, Hiroto: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,940,999, Cl. 346-140.00R.
Matsuda, Takashi, to Takara Co., Ltd. Connectable self-powdered mobile toy. 4,940,442, Cl. 446-90.000.
Matsui, Kazuhiro: *See*—
Hoshino, Yoshihiro; and Matsui, Kazuhiro, 4,939,970, Cl. 84-293.000.
Matsui, Kenji: *See*—
Igarashi, Kimio; Uchida, Yasuo; and Matsui, Kenji, 4,941,181, Cl. 382-1.000.
Matsui, Susumu: *See*—
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.
Matsumoto, Hideo; Sato, Katsumi; and Hokuyo, Shigeru, to Mitsubishi Denki Kabushiki Kaisha. Solar battery device. 4,940,496, Cl. 136-256.000.
Matsumoto, Satoru: *See*—
Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, 4,940,542, Cl. 210-321.800.
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, to Nippon Ester Co., Ltd. Process for producing flame resistant polyester. 4,940,772, Cl. 528-272.000.
Matsunaga, Tsugiharu; Hayashi, Yasutaka; and Hattori, Katsuhiko, to Kabushiki Kaisha Toyota Chuo Kenkyusho. Steering gear for a vehicle. 4,940,105, Cl. 180-133.000.
Matsuo, Yoshihiro: *See*—
Nogami, Yoshio; Matsuo, Yoshihiro; Fujii, Takayuki; and Urashi, Seiichi, 4,940,111, Cl. 180-219.000.
Matsushita, Akira: *See*—
Takada, Susumu; Fujishita, Toshio; Sasatani, Takashi; Matsushita, Akira; and Eigyo, Masami, 4,940,714, Cl. 514-293.000.
Matsushita Electric Industrial Co., Ltd.: *See*—
Kawaguchi, Takao; Tamura, Tatsuhiko; and Takeda, Etsuya, 4,940,934, Cl. 324-158.00R.
Pithouse, Kenneth B.; Kridl, Thomas A.; Triplett, James T.; and Wille, Marc, 4,940,820, Cl. 428-34.900.
Sakurai, Tsutomu; Hara, Yoshifumi; and Dougakiuchi, Yasumasa, 4,941,206, Cl. 455-607.000.
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.
Matsushita, Kiwami: *See*—
Kitayama, Tadayoshi; Matsushita, Kiwami; and Motoshima, Kuniaki, 4,940,306, Cl. 350-96.160.
Matsushita, Takashi: *See*—
Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.
Matsuzawa, Katsuto: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.
Matthewson, Michael D., to Burroughs Wellcome Co. Pesticidal formulations. 4,940,729, Cl. 514-521.000.
Matunaga, Akira; Inoue, Hideo; Ikezawa, Ken; and Arai, Tetu, to Amano Corporation. Floor polisher with a dust collecting device. 4,939,811, Cl. 15-385.000.
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., to International Business Machines Corporation. Secure management of keys using control vectors. 4,941,176, Cl. 380-21.000.
Matzke, Wolf-Ekkehard: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.
Maurer, Fritz; Homeyer, Bernhard; and Behrenz, Wolfgang, to Bayer Aktiengesellschaft. Insecticidal thionophosphonates. 4,940,698, Cl. 514-86.000.
Mauser-Werke Oberndorf GmbH: *See*—
Hoffman, Dietrich, 4,939,997, Cl. 102-503.000.
Max Spaleck GmbH & Co.: *See*—
Ditscherlein, Friedhold, 4,939,871, Cl. 51-163.200.
May and Baker Limited: *See*—
Hewett, Richard H.; and Luscombe, Brian M., 4,940,484, Cl. 71-94.000.
May, Marvin M.: *See*—
Hancock, Mark W.; and May, Marvin M., 4,940,164, Cl. 222-66.000.
Mayer, Wolfram: *See*—
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, 4,940,047, Cl. 128-90.000.
Mayernik, Andrew B., to Dormont Manufacturing Company. Fitting for tubing. 4,940,263, Cl. 285-342.000.
Mayeski, Henry A.: *See*—
Zeller, Claude; Mayeski, Henry A.; and Murphy, Charles F., III, 4,940,959, Cl. 338-13.000.
Mayhew, Richard K., II: *See*—
Mayhew, Susan L.; and Mayhew, Richard K., II, 4,940,003, Cl. 108-44.000.
Mayhew, Susan L.; and Mayhew, Richard K., II. Car seat table. 4,940,003, Cl. 108-44.000.
Mazda Motor Corporation: *See*—
Fujieda, Fusao, 4,940,122, Cl. 192-3.310.
Komatsu, Nobuhiro, 4,940,281, Cl. 296-194.000.
Mazeran, Jean-Jacques. Method and device for fabricating moulds from granular material. 4,940,071, Cl. 164-7.200.
Mazur, Richard J.: *See*—
Wood, James A.; and Mazur, Richard J., 4,941,099, Cl. 364-426.020.
McCarthy, John, to MPH Industries, Inc. Scrap loader for molten metal furnace. 4,940,376, Cl. 414-198.000.
McCarthy, Patrick D. Centralized consumer cash value accumulation system for multiple merchants. 4,941,090, Cl. 364-405.000.
McCartney, Andrew; and McCartney, Thomas, to Oneac Corporation. Line noise signal measurement system using analog signal compression with digital linearity correction. 4,940,947, Cl. 324-613.000.
McCartney, Thomas; and Lace, Melvin A., to Oneac Corporation. Telephone lines overvoltage protection apparatus. 4,941,063, Cl. 361-119.000.
McCartney, Thomas: *See*—
McCartney, Andrew; and McCartney, Thomas, 4,940,947, Cl. 324-613.000.
McCollum, John L.: *See*—
Chen, Shih-Ou; McCollum, John L.; and Chiang, Steve S., 4,941,028, Cl. 357-23.130.
McCormick, Daniel F., to Brunswick Corporation. High pressure and high lift pump impeller. 4,940,402, Cl. 418-154.000.
McCreary, Robert A., Jr., to Atlantic Richfield Company. Excavator dipper with lightweight replaceable section. 4,939,855, Cl. 37-103.000.
McDonnell Douglas Corporation: *See*—
Porter, Robert D., 4,939,845, Cl. 33-199.00R.
McDowell, Curtis S., to Tri-Bio, Inc. Submerged biological wastewater treatment system. 4,940,540, Cl. 210-150.000.
McFarlane, Arthur M. G.; and McFarlane, Stuart R. Automatic edger saw. 4,941,100, Cl. 364-474.090.
McFarlane, Stuart R.: *See*—
McFarlane, Arthur M. G.; and McFarlane, Stuart R., 4,941,100, Cl. 364-474.090.
McGough, Gerald B. Plastic housing for telephone paystation. 4,940,296, Cl. 312-100.000.
McGuire, Sam R. Process for building wire. 4,940,211, Cl. 254-134.30R.
McKee, Bobby D.; and Nakagawa, Alvin H., to Westinghouse Electric Corp. Anisotropic resistivity material and method of making same. 4,940,878, Cl. 219-121.640.
McKee, Graham E.: *See*—
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.
McKesson Corporation: *See*—
Fiorentino, Frank S.; and Patton, Douglas M., 4,939,800, Cl. 4-620.000.
McMillin, John R., to Cornelius Company, The. Method of and dispensing head for increased carbonation. 4,940,165, Cl. 222-129.100.
McNeil-PPC, Inc.: *See*—
Salerno, Catherine E., 4,940,462, Cl. 604-387.000.
McNorgan, Richard M.: *See*—
Pocock, Terrence H.; Coumans, Peter J. M.; McNorgan, Richard M.; and Hart, George M., 4,941,040, Cl. 358-86.000.
Mead Corporation, The: *See*—
Davis, Paul D.; Hillenbrand, Gary F.; and Adair, Paul C., 4,940,645, Cl. 430-438.000.
Walowit, Eric, 4,941,038, Cl. 358-80.000.
Means, Rodney J.: *See*—
Kulakowski, John E.; Means, Rodney J.; Oldham, David M.; and Tayefeh, Morovat, 4,941,139, Cl. 369-54.000.
Mechalas, Emmanuel; and Foran, Laverne E. Apparatus and method for continuous measurement of suspended solids in a liquid medium with wiping means. 4,940,902, Cl. 250-573.000.
Meckel, Walter: *See*—
Rosthauser, James W.; and Meckel, Walter, 4,940,750, Cl. 524-871.000.
Meco Mining Equipment Limited: *See*—
Brown, Stephen A.; and Sleigh, Neville J. H., 4,940,363, Cl. 405-296.000.

Medan, Yoav, to International Business Machines Corp. Signal coding process and system for implementing said process. 4,941,152, Cl. 375-27.000.

Medtronic, Inc.: *See*—
Taylor, William J.; Weiss, Douglas; and Lessar, Joseph F., 4,940,858, Cl. 174-152.0GM.

MEI Services, Inc.: *See*—
Krause, Ronald O., 4,940,506, Cl. 156-584.000.

Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, to Bayer Aktiengesellschaft. Thermoplastic moulding compositions based on polyvinyl chloride and a poly-α-olefine/polyurethane block copolymer. 4,940,755, Cl. 525-90.000.

Meijboom, Nicolaas: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.

Meister, John J. Water soluble graft copolymers of lignin and methods of making the same. 4,940,764, Cl. 527-400.000.

Melvin, Lawrence S.: *See*—
Walker, Frederick J.; and Melvin, Lawrence S., 4,940,712, Cl. 514-272.000.

Menard, Alan W., to United Technologies Corporation. Core pinning machine. 4,940,074, Cl. 164-412.000.

Menconi, Martial: *See*—
Boule, Jean-Pierre; Hamel, Dominique; Hamel, Dominique; and Menconi, Martial, 4,941,173, Cl. 380-25.000.

Merck & Co., Inc.: *See*—
Corley, Edward G.; Larsen, Robert D.; Grabowski, Edward J. J.; and Reider, Paul, 4,940,813, Cl. 560-103.000.
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.
Jones, Todd K.; Mills, Sander G.; and Desmond, Richard, 4,940,797, Cl. 548-110.000.
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,520, Cl. 204-157.710.
Mills, Sander G.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,803, Cl. 549-302.000.

Merck Frosst Canada, Inc.: *See*—
Gillard, John W.; Yoakim, Christiane; Guindon, Yvan; and Girard, Yves, 4,940,719, Cl. 514-381.000.

Merck Sharp & Dohme Limited: *See*—
Baker, Raymond; Kneen, Clare O.; Saunders, John; and Swain, Christopher, 4,940,703, Cl. 514-210.000.

Merlin C.T.C. Production Division Nederland B.V.: *See*—
Raar, Hans, 4,940,345, Cl. 400-195.000.

Mero-Raumstruktur GmbH & Co.: *See*—
Filip, Octavian, 4,939,882, Cl. 52-648.000.

Merril, Carl R.: *See*—
Warrington, Richard E.; Khan, Abbas A.; and Merril, Carl R., 4,940,659, Cl. 435-7.000.

Messerschmitt-Bolkow-Blohm GmbH: *See*—
Hofmann, Otto, 4,940,312, Cl. 350-286.000.

Mesteller, Robert A.: *See*—
Randall, James E.; Lemke, Ronald D.; and Mesteller, Robert A., 4,940,040, Cl. 126-21.00A.

Metal Box Public Limited Company: *See*—
Ball, Martin F., 4,940,169, Cl. 222-399.000.

Meunier, Paul-Louis; Penot, Alain; Coutellier, Jean-Marc; and Bussac, Claude, to Compagnie Europeenne de Composants Electroniques LCC. Method for the fabrication of a magnetic recording/reading head from a magnetic substrate. 4,939,836, Cl. 29-603.000.

Meunier, Paul-Louis: *See*—
Coutellier, Jean-Marc; Jacobelli, Alain; Magna, Henriette; and Meunier, Paul-Louis, 4,939,835, Cl. 29-603.000.

Meurer, Kurt P.: *See*—
Meier, Lothar; Gartner, Maria; Meurer, Kurt P.; Franke, Joachim; and Lindner, Christian, 4,940,755, Cl. 525-90.000.

Meyer, Alfred: *See*—
Muller, Urs; Tobler, Hans; Rempfler, Hermann; and Meyer, Alfred, 4,940,481, Cl. 71-76.000.

Meyer, Robert: *See*—
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,940,916, Cl. 313-306.000.

Meyer, Willy: *See*—
Bohner, Beat; and Meyer, Willy, 4,940,482, Cl. 71-92.000.
Topfl, Werner; Meyer, Willy; and Schneider, Hans-Dieter, 4,940,792, Cl. 544-321.000.

Mez, Georg. Flange connection. 4,940,264, Cl. 285-405.000.

Miba Sinter: *See*—
Gramberger, Johann, 4,940,847, Cl. 156-89.000.

Microelectronics and Computer Technology Corporation: *See*—
Nelson, Richard D.; Gupta, Omkarnath R.; and Herrell, Dennis J., 4,940,085, Cl. 165-80.300.

Microfast Controls Corp.: *See*—
Kumar, Shalabh; and Edgar, Duane S., 4,941,081, Cl. 364-140.000.

Mid-West Conveyor Co., Inc.: *See*—
Burt, Harold S.; and Difalco, Benjamin P., 4,939,999, Cl. 104-88.000.

Mihashi, Kazuo: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.

Mikami, Takashi: *See*—
Yamazaki, Masayuki; Takado, Yutaka; and Mikami, Takashi, 4,940,270, Cl. 293-122.000.

Miki, Hiroyuki; and Kawakami, Yasushi, to Nissan Motor Company, Limited. Apparatus for scanning recording media with an automatic medium-change mechanism and structure for mounting same on a vehicle. 4,940,275, Cl. 296-37.800.

Miles, Barry M.: *See*—
Juskey, Frank J., Jr.; Miles, Barry M.; and Suppelsa, Anthony B., 4,940,181, Cl. 228-180.200.

Miller, Harry, to Omega Corporation. Boat shoe. 4,939,851, Cl. 36-3.00B.

Miller, John W. V.; and Miller, Peter S., to O-I Neg TV Products, Inc. Formerly known as Owens-Illinois Television Products, Inc.). Image analysis system employing filter look-up tables. 4,941,191, Cl. 382-54.000.

Miller, Joseph T.; and Brown, Edward F., to Mocap. Fingernail clipper pouch. 4,940,136, Cl. 206-38.100.

Miller, Kevin P.: *See*—
Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sudol, Marion A., 4,940,592, Cl. 426-94.000.

Miller, Peter S.: *See*—
Miller, John W. V.; and Miller, Peter S., 4,941,191, Cl. 382-54.000.

Miller, Ronald B.: *See*—
Jenkins, Anthony W.; Leslie, Stewart T.; and Miller, Ronald B., 4,940,587, Cl. 424-480.000.

Miller, S. Scott. Surfboard with angularly related fins. 4,940,438, Cl. 441-79.000.

Miller, Tony D.: *See*—
Naylor, Jimmy R.; Burt, Rodney T.; and Miller, Tony D., 4,940,981, Cl. 341-161.000.

Milliser, John S.: *See*—
Marvell, Michael D.; and Milliser, John S., 4,940,375, Cl. 411-181.000.

Millitech Corporation: *See*—
Huguenin, George R., 4,940,986, Cl. 342-410.000.

Mills, Jesse V., to Henley Manufacturing Holding Company, Inc. Boat-type rocker arm with flanges. 4,940,048, Cl. 123-90.390.

Mills, Sander G.; Volante, Ralph P.; and Shinkai, Ichiro, to Merck & Co., Inc. Process for synthesis of 1R,2R,5R-2-hydroxy-6-oxo-7-oxabicyclo[3.2.1]-octane. 4,940,803, Cl. 549-302.000.

Mills, Sander G.: *See*—
Jones, Todd K.; Mills, Sander G.; and Desmond, Richard, 4,940,797, Cl. 548-110.000.

Minami, Kenji: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Minnesota Mining and Manufacturing Company: *See*—
Culler, Scott R.; and Wakefield, David L., 4,940,607, Cl. 427-140.000.
Debe, Mark K., 4,940,854, Cl. 428-411.100.
Joyce, Terrence H., 4,941,190, Cl. 382-54.000.
Randen, Neil A., 4,940,579, Cl. 424-78.000.
Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank P.; Gilbert, James R.; and Aspen, Frank E., 4,940,495, Cl. 136-256.000.
Wright, Robin E., 4,940,596, Cl. 427-47.000.

Minolta Camera Kabushiki Kaisha: *See*—
Hamada, Akiyoshi, 4,940,310, Cl. 250-236.000.
Mishima, Nobuhiro; and Araki, Kazuhiro, 4,941,017, Cl. 355-218.000.
Saijo, Hiromitsu; Hayashi, Masamichi; and Morikawa, Takeji, 4,940,014, Cl. 118-658.000.

Minovitch, Michael A. Electromagnetic ground to orbit propulsion method and operating system for high mass payloads. 4,939,976, Cl. 89-8.000.

Minster Machine Company, The: *See*—
Schoch, Daniel A., 4,939,918, Cl. 72-20.000.

Mirenna, Luigi: *See*—
Colle, Roberto; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,940,724, Cl. 514-397.000.

Mishima, Nobuhiro; and Araki, Kazuhiro, to Minolta Camera Kabushiki Kaisha. Copying apparatus having a binding margin forming function. 4,941,017, Cl. 355-218.000.

Mishima, Tadaaki; Kanasaki, Morio; Takatoo, Masao; and Ota, Hideo, to Hitachi, Ltd. Method and apparatus for recognizing pattern of gray level image. 4,941,192, Cl. 382-54.000.

Mishima, Tadahiko: *See*—
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

Mitsubishi Denki Kabushiki Kaisha: *See*—
Itoh, Masateru, 4,941,036, Cl. 358-60.000.
Kato, Hisao, 4,941,103, Cl. 364-513.000.
Kegasa, Koyo, 4,940,952, Cl. 331-11.000.
Kishida, Satoru, 4,941,033, Cl. 357-75.000.
Kitayama, Tadayoshi; Matsushita, Kiwami; and Motoshima, Kuniaki, 4,940,306, Cl. 350-96.160.
Majumdar, Gourab, 4,941,030, Cl. 357-43.000.
Matsumoto, Hideo; Sato, Katsumi; and Hokuyo, Shigeru, 4,940,496, Cl. 136-256.000.
Mizuno, Shigeki; Ueda, Takaharu; and Yamamoto, Tetsu, 4,940,924, Cl. 318-560.000.
Morishita, Mitsuharu, 4,940,102, Cl. 180-79.100.
Nishimura, Shinji, 4,940,928, Cl. 322-28.000.

Ootsuka, Shigeharu, 4,940,958, Cl. 335-230.000.
Teshima, Takeo; and Konno, Makoto, 4,941,104, Cl. 364-474.300.
Watanabe, Naoki, 4,940,871, Cl. 219-69.120.
Yasukawa, Takeshi; and Onishi, Masayoshi, 4,941,098, Cl. 364-426.040.
Yoshioka, Koichi, 4,941,062, Cl. 360-106.000.

Mitsubishi Jidosha Kogyo Kabushiki Kaisha: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Mitsubishi Oil Co., Ltd.: *See*—
Miyashi, Tsutomu; Yamashita, Yoshiro; Suzuki, Takanori; and Fujii, Hiroshi, 4,940,832, Cl. 585-863.000.

Mitsubishi Paper Mills Limited: *See*—
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,940,657, Cl. 430-578.000.

Mitsubishi Pencil Co., Ltd.: *See*—
Konose, Yoshiomi, 4,940,351, Cl. 401-278.000.

Mitsubishi Rayon Company, Ltd.: *See*—
Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, 4,940,778, Cl. 528-481.000.
Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, 4,940,542, Cl. 210-321.800.

Mitsubishi Rayon Engineering Co., Ltd.: *See*—
Nakaji, Nobuo; Kojima, Hideki; and Tachibana, Ryoichi, 4,940,337, Cl. 366-148.000.

Mitsui Petrochemical Industries: *See*—
Yatsu, Tadao; and Hinooka, Nobuya, 4,940,616, Cl. 428-35.700.

Mitsui Petrochemical Industries, Ltd.: *See*—
Ushida, Yoshihisa; Hirai, Nobuki; and Mase, Hiroshi, 4,940,681, Cl. 501-134.000.

Miura, Chiyoshi: *See*—
Maki, Toshio; Miura, Chiyoshi; and Kono, Michitoshi, 4,939,829, Cl. 29-159.200.

Miura, Hidetoshi: *See*—
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, 4,940,657, Cl. 430-578.000.

Miwa, Harufumi; Kashiwada, Minoru; and Yahagi, Yoshimasa, to Ajinomoto Co., Inc. Fluorescent analysis apparatus. 4,940,332, Cl. 356-417.000.

Miyahara, Kazuhiro: *See*—
Ogura, Koji; and Miyahara, Kazuhiro, 4,940,408, Cl. 432-137.000.

Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, to Mitsubishi Jidosha Kogyo Kabushiki Kaisha. Power transmission system using toothed belt of engine for vehicle. 4,940,450, Cl. 474-152.000.

Miyashi, Tsutomu; Yamashita, Yoshiro; Suzuki, Takanori; and Fujii, Hiroshi, to Tsutomu Miyashi; and Mitsubishi Oil Co., Ltd. Process for separating 2,6-dimethylnaphthalene. 4,940,832, Cl. 585-863.000.

Miyata, Hiroshi: *See*—
Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,940,715, Cl. 514-293.000.

Miyata, Koichi: *See*—
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Miyatake, Sinichi: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.

Miyazaki, Noboru: *See*—
Aihara, Yasuyuki; Kano, Hideki; Tsuchiya, Yoshikazu; and Miyazaki, Noboru, 4,940,423, Cl. 439-369.000.

Miyazaki, Yoshio: *See*—
Shimazaki, Norihiko; Hemmi, Keiji; Nakaguti, Osamu; Miyazaki, Yoshio; and Hashimoto, Masashi, 4,940,709, Cl. 514-253.000.

Miyazawa, Kiyoshi; and Shimizu, Shigemi, to Sanden Corporation. Compressor with a radial bearing for supporting a drive shaft. 4,940,342, Cl. 384-510.000.

Mizukami, Toshihiko, to NEC Corporation. Data transmission device capable of adaptively varying a packet size without an increase in hardware. 4,941,144, Cl. 371-5.500.

Mizuno, Genji: *See*—
Nishii, Michiharu; Tada, Yoshihiko; and Mizuno, Genji, 4,940,290, Cl. 303-6.010.

Mizuno, Keiichiro; and Iida, Kazuyoshi, to Bridgestone Corporation. Vibration absorbing apparatus. 4,940,914, Cl. 310-326.000.

Mizuno, Shigeki; Ueda, Takaharu; and Yamamoto, Tetsu, to Mitsubishi Denki Kabushiki Kaisha. Positioning control apparatus. 4,940,924, Cl. 318-560.000.

Mizuno, Tsuyoshi: *See*—
Kawasaki, Hisamitsu; Nakashima, Kunimichi; Araki, Kazunori; and Mizuno, Tsuyoshi, 4,939,834, Cl. 29-568.000.

Mobay Corporation: *See*—
Jackman, Dennis E.; Combs, Gary W.; and Westphal, Dietmar B., 4,940,815, Cl. 564-18.000.
Nicola, William J.; and Reichmann, Wolfgang W., 4,940,632, Cl. 428-318.400.
Rosthauser, James W.; and Meckel, Walter, 4,940,750, Cl. 524-871.000.

Mobex Corporation: *See*—
Rehberg, Thomas R.; and Brailoff, Sam, 4,940,407, Cl. 431-126.000.

Mobil Oil Corporation: *See*—
Hoskin, Dennis H.; and Shu, Paul, 4,940,090, Cl. 166-270.000.
Kwack, Tae H., 4,939,825, Cl. 26-93.000.
Shu, Paul; and Shu, Winston R., 4,940,091, Cl. 166-270.000.

Mocap: *See*—
Miller, Joseph T.; and Brown, Edward F., 4,940,136, Cl. 206-38.100.

Mochizuki, Seiji: *See*—
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,941,002, Cl. 346-160.000.

Mockel, Reinhart; and Putzar, Roland, to Ciba-Geigy Corporation. Low-foaming composition for finishing synthetic fibres: dye or optical brightener or ultra-violet absorber and alkylene-diamide:ethylene-distearamide. 4,940,469, Cl. 8-527.000.

Modine Manufacturing Company: *See*—
Stay, Kevin E., 4,940,086, Cl. 165-173.000.

Mohr, Peter: *See*—
Klaus, Michael; Mohr, Peter; and Weiss, Ekkehard, 4,940,707, Cl. 514-237.800.

Moisset, Jean-Claude: *See*—
Petit, Nicaise; and Moisset, Jean-Claude, 4,940,494, Cl. 134-1.000.

Molbaek, Jens J.: *See*—
Kyster, Erik; Jakobsen, Niels-Henrik G.; Molbaek, Jens J.; Stenderup, Ole; and Straede, Bjarne, 4,940,538, Cl. 210-137.000.

Molex Incorporated: *See*—
Kano, Kouji; Ogawa, Sumitaka; Sano, Minoru; and Sakano, Masahiro, 4,940,421, Cl. 439-273.000.

Moline, Timothy W., to Control Data Corporation. Method and apparatus for predicting an overflow in an integer multiply. 4,941,119, Cl. 364-745.000.

Moller, Dieter; and Fischer, Georg, to Benz & Hilgers GmbH. Filling apparatus for filling a container with a measured amount of a liquid, pasty or lumpy product. 4,940,172, Cl. 222-505.000.

Molnar nee Bako, Erzsebet: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Momiyama, Fujio, to Hino Jidosha Kogyo Kabushiki Kaisha (Hino Motors, Ltd.). Power steering system for use in motor vehicle. 4,940,103, Cl. 180-132.000.

Momiyama, Yoshiharu: *See*—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.

Momose, Den-ichi: *See*—
Kurashina, Yoshikazu; Miyata, Hiroshi; and Momose, Den-ichi, 4,940,715, Cl. 514-293.000.

Mondek, Matthew H.: *See*—
Osborn, Harold L.; Mondek, Matthew H.; Hervat, John C.; and Whipple, Roger B., 4,940,435, Cl. 440-89.000.

Monnike, Kristian B.: *See*—
Hemmingsen, Hans; Christensen, Lars S.; and Monnike, Kristian B., 4,941,056, Cl. 358-497.000.

Monoclonetics International, Inc.: *See*—
Warrington, Richard E.; Khan, Abbas A.; and Merril, Carl R., 4,940,659, Cl. 435-7.000.

Monsanto Company: *See*—
Shah, Dilip M.; Rogers, Stephen G.; Horsch, Robert B.; and Fraley, Robert T., 4,940,835, Cl. 800-205.000.

Monte, Louis H.: *See*—
Jeyarajan, Arunachalam; Graham, Lawrence D.; Brokloff, John E.; and Monte, Louis H., 4,940,073, Cl. 164-361.000.

Montedipe S.p.A.: *See*—
Tonti, Sergio; Furlan, Piero; and Talamini, Gianpietro, 4,940,773, Cl. 528-315.000.

Monzen, Takashi: *See*—
Watanabe, Masaharu; and Monzen, Takashi, 4,940,562, Cl. 264-234.000.

Moody, Herbert, III: *See*—
Honeycutt, LeRoy, III; Key, James C.; and Moody, Herbert, III, 4,940,077, Cl. 164-463.000.

Moore, Charles E.: *See*—
Bohley, Thomas K.; Garnett, Grosvenor H.; Koerner, Christopher; and Moore, Charles E., 4,940,979, Cl. 341-152.000.

Moore, Henry J., Jr.; and Garrett, Michael K., to Mor-Flo Industries, Inc. System and apparatus for venting water heater. 4,940,042, Cl. 126-344.000.

Moore, Morris A.: *See*—
Patsiokas, Stelios J.; Moore, Morris A.; and Johnson, Brian K. A., 4,941,203, Cl. 455-53.000.

Moore, Steven R.: *See*—
Holmes, Maurice F.; Roller, George J.; and Moore, Steven R., 4,941,023, Cl. 355-319.000.

Mor-Flo Industries, Inc.: *See*—
Moore, Henry J., Jr.; and Garrett, Michael K., 4,940,042, Cl. 126-344.000.

Moran, Daniel B.: *See*—
Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, 4,940,710, Cl. 514-254.000.

Morbitzer, Rainer: *See*—
Hilgers, Heinz; Morbitzer, Rainer; and Windeln, Johannes, 4,940,606, Cl. 427-130.000.

Mordue, George S.: *See*—
Amra, Lutfi H.; Byrne, Thomas M., Jr.; Martin, Harvey; Mordue, George S.; and Neff, David V., 4,940,384, Cl. 415-121.200.

Morena, Robert M.: *See*—
Beall, George H.; Danielson, Paul S.; and Morena, Robert M., 4,940,674, Cl. 501-4.000.

Morgan, Edward B.: *See*—
Horne, Colin; and Morgan, Edward B., 4,940,387, Cl. 415-221.000.

Morgan, Stephen W.: *See*—
Petterson, William C.; Wells, Thomas A.; Cherish, Peter; and Morgan, Stephen W., 4,940,828, Cl. 585-652.000.

Mori, Toshihiko: *See*—
Nakamoto, Yakka; and Mori, Toshihiko, 4,941,149, Cl. 373-96.000.

Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, to Nippon Shokubai Kagaku Kogyo Co., Ltd. Carbon black-graft polymer, method for production thereof, and use thereof. 4,940,749, Cl. 524-547.000.

Morikawa, Koji, to Fuji Jukogyo Kabushiki Kaisha. Abnormality detecting system for an automotive engine. 4,940,030, Cl. 123-198.00D.

Morikawa, Takeji: *See*—
Saijo, Hiromitsu; Hayashi, Masamichi; and Morikawa, Takeji, 4,940,014, Cl. 118-658.000.

Morinaga, Kaoru: *See*—
Ono, Takuro; Aoyama, Noboru; and Morinaga, Kaoru, 4,941,140, Cl. 369-264.000.

Morioka, Joji: *See*—
Tadokoro, Shigeo; Morioka, Joji; and Takahashi, Hideyuki, 4,940,500, Cl. 156-204.000.

Morishita, Mitsuharu, to Mitsubishi Denki Kabushiki Kaisha. Motor-driven power steering system. 4,940,102, Cl. 180-79.100.

Morita, Toshiaki: *See*—
Tanaka, Hideaki; Morita, Toshiaki; and Konya, Minehiro, 4,941,195, Cl. 382-61.000.

Morris, Gregory J. E., to Dow Chemical Company, The. Combination seal member and membrane holder for a filter press type electrolytic cell. 4,940,518, Cl. 204-128.000.

Morris, Michael; and Vickers, John, to Oxley Developments Company Limited. Metallizing paste. 4,940,849, Cl. 428-209.000.

Morrow, J. Thomas: *See*—
Casey, James P., I.; and Morrow, J. Thomas, 4,940,460, Cl. 604-143.000.

Mortensen, Steven L. Golf swing aid apparatus. 4,940,237, Cl. 273-189.00R.

Morters, Ronald W., to Enercon Industries Corporation. Electrode for a corona discharge apparatus. 4,940,894, Cl. 250-324.000.

Mosby, James F.: *See*—
Beaton, William I.; Taylor, James L.; Peck, Lawrence B.; and Mosby, James F., 4,940,529, Cl. 208-61.000.

Moser, Hans: *See*—
Bohner, Beat; Moser, Hans; and Pissiotas, Georg, 4,940,485, Cl. 71-96.000.

Moss, Daniel H. Reverse circulation drill rod. 4,940,098, Cl. 175-320.000.

Moss, Thomas H., III; Sargent, Ralph R.; and Williams, Michael S., to Peach State Labs, Inc. Stain resistant polymeric composition. 4,940,757, Cl. 525-502.000.

Motoe, Hisafumi; Kawashima, Hiroyuki; and Tokuhara, Masaharu, to Sony Corporation. Signal processing circuit for a moving detection circuit which includes coefficient generator wherein a number of delay devices are connected in series with the first one receiving the output of a moving detection circuit and including a time base filter. 4,941,046, Cl. 358-167.000.

Motoike, Tatsuya: *See*—
Yasumoto, Masami; Motoike, Tatsuya; and Sawasa, Toshiyuki, 4,941,072, Cl. 362-249.000.

Motorola, Inc.: *See*—
Baracat, Frederick A.; and Yaeger, Stanley A., Jr., 4,940,262, Cl. 285-114.000.
Cannalte, Gary A.; Smith, Todd; Zancho, William F.; and Crawford, Robert J., 4,941,167, Cl. 379-67.000.
Craft, Scott, 4,941,067, Cl. 361-386.000.
Gutman, Jose; and Shapiro, Steven C., 4,940,963, Cl. 340-313.000.
Harbarger, Josephine, 4,940,507, Cl. 156-636.000.
Higgins, Robert J., Jr., 4,940,955, Cl. 333-204.000.
Juskey, Frank J., Jr.; Miles, Barry M.; and Suppelsa, Anthony B., 4,940,181, Cl. 228-180.200.
Patsiokas, Stelios J.; Moore, Morris A.; and Johnson, Brian K. A., 4,941,203, Cl. 455-53.000.
Thome, John R.; and Yu, Sypyng B., 4,939,942, Cl. 73-865.900.

Motoshima, Kuniaki: *See*—
Kitayama, Tadayoshi; Matsushita, Kiwami; and Motoshima, Kuniaki, 4,940,306, Cl. 350-96.160.

Mouchot, Carine; and Frappier, Gerard; to Societe d'Applications Generales d'Electricite et de Mecanique (S A G E M). Method of representing a perspective image of a terrain and a system for implementing same. 4,940,972, Cl. 340-747.000.

Mouri, Takayuki: *See*—
Sakamoto, Daishiro; Mouri, Takayuki; and Tamura, Hisao, 4,940,266, Cl. 292-227.000.

Moyer, James D., to Bentley-Harris Manufacturing Company, The. Wraparound closure device. 4,939,819, Cl. 24-16.00R.

MPH Industries, Inc.: *See*—
McCarthy, John, 4,940,376, Cl. 414-198.000.

MTU Motoren Und Turbinen- Union Munchen GmbH: *See*—
Grieb, Hubert, 4,940,084, Cl. 165-76.000.

MTU Motoren- Und Turbinen-Union Munich GmbH: *See*—
Luxenburger, Gerd, 4,940,389, Cl. 416-193.00A.

Mucha, Franz: *See*—
Habelt, Gerhard; and Mucha, Franz, 4,940,994, Cl. 346-76.0PH.

Mucke, Ingo, to Kali-Chemie Aktiengesellschaft. Stabilization of carrier-bound enzymes by treatment with a bifunctional crosslinking agent and a polyamine. 4,940,664, Cl. 435-176.000.

Mueller, Erich R.: *See*—
Muller, Erich R., 4,940,565, Cl. 419-8.000.

Mueller, Walter B.; and Schirmer, Henry G., to W. R. Grace & Co.-Conn. High barrier low profile forming web. 4,940,634, Cl. 428-349.000.

Muisener, Charles M., to Loctite Corporation. Water purification system. 4,940,537, Cl. 210-96.100.

Mulder, Theodor; and Kaplinsky, Cecil H., to Plus Logic, Inc. Configuration control circuit for programmable logic devices. 4,940,909, Cl. 307-465.000.

Muller, Erich R., to Mueller, Erich R. Method for manufacturing frictional locking rings for stepped motor vehicle transmission synchronizing mechanisms. 4,940,565, Cl. 419-8.000.

Muller, Urs; Tobler, Hans; Rempfler, Hermann; and Meyer, Alfred, to Ciba-Geigy Corporation. Microbicidal and growth regulating compositions. 4,940,481, Cl. 71-76.000.

Mullverbrennungsanlage Wuppertal GmbH: *See*—
Temelli, Sedat, 4,940,006, Cl. 110-243.000.

Multicore Solders Limited: *See*—
Rubin, Wallace, 4,940,498, Cl. 148-23.000.

Munenaka, Katsumi: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Munie, Richard T., to Ford Motor Company. Electrical connector with retained boot. 4,940,420, Cl. 439-272.000.

Murakami, Keikichi: *See*—
Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, 4,940,488, Cl. 75-500.000.

Muramoto, Tomotaka, to Canon Kabushiki Kaisha. Color-difference line-sequential signal processing apparatus. 4,941,054, Cl. 358-310.000.

Murata Kikai Kabushiki Kaisha: *See*—
Fujiwara, Michiaki, 4,939,893, Cl. 57-22.000.
Kikuchi, Shuichi; and Kawasaki, Yoshihiko, 4,940,127, Cl. 198-350.000.

Murata, Kiyohito: *See*—
Sato, Kiyoomi; Ushijima, Fumihiro; and Murata, Kiyohito, 4,940,125, Cl. 192-85.0AA.

Murawski, Charles S.: *See*—
Galuska, Raymond D.; and Murawski, Charles S., 4,940,124, Cl. 192-70.280.

Murayama, Hiroshi: *See*—
Ishida, Nobuaki; Ishimura, Yoshifumi; and Murayama, Hiroshi, 4,940,234, Cl. 273-1.0GA.

Murayama, Masatosi: *See*—
Taguchi, Hanzo; Mantani, Rokurota; Murayama, Masatosi; and Nishino, Toshihiro, 4,939,969, Cl. 84-719.000.

Murayama, Yasushi: *See*—
Uchida, Takashi; Hoshino, Osamu; and Murayama, Yasushi, 4,941,021, Cl. 355-285.000.

Murozono, Mikio: *See*—
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.

Murphy, Charles F., III: *See*—
Zeller, Claude; Mayeski, Henry A.; and Murphy, Charles F., III, 4,940,959, Cl. 338-13.000.

Murray, Scott V.: *See*—
Helling, James C.; Beckrot, Anders W.; and Murray, Scott V., 4,940,921, Cl. 315-219.000.

Musil, Joseph E., to Cedarapids, Inc. Reverse flow mixing method for direct-fired asphaltic concrete drum mixers. 4,940,334, Cl. 366-4.000.

Mycynek, Victor G., to Zenith Electronics Corporation. Stepwise adjusted digital to analog converter having self correction. 4,940,978, Cl. 341-150.000.

Myers, Terry D.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Pullmer, David J.; Brewer, Michael H.; Henninga, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.

Naber, Wilfried; Ungerer, Heinz-Jurgen; and Sistermann, Klaus, to Grunzweig & Hartmann AG. Method of melting raw materials. 4,940,478, Cl. 65-27.000.

Nabisco Brands, Inc.: *See*—
Aquino, Agostino; and Lang, Karl U., 4,940,130, Cl. 198-432.000.
Van Alstine, Terrance L., 4,940,594, Cl. 426-231.000.

Nada, Minoru: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Nagai, Isamu: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Nagai, Satomi: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.

Nagaoka, Hitoshi: *See*—
Tsukamoto, Shin-ichi; Nagaoka, Hitoshi; Usuda, Shinji; Harada, Masatomi; and Tamura, Toshinari, 4,940,795, Cl. 546-16.000.
Nagasaka, Youetsu, to Shiroki Corporation. Seat for automobile. 4,940,284, Cl. 297-284.000.
Nagasaki, Satoru, to Konica Corporation. Method of processing silver halide photographic material which prevents sepia deterioration. 4,940,652, Cl. 430-403.000.
Nagasawa, Herbert T.; and Kwon, Chul-Hoon, to University of Minnesota, Regents of the. Acylated cyanamide compounds. 4,940,816, Cl. 564-103.000.
Nagata, Tatsuya; Yamada, Takehiko; Hara, Eiichi; and Watanabe, Michihiro, to Hitachi, Ltd. Direct-contact-type image sensor and image sensor assembly. 4,940,888, Cl. 250-208.100.
Nahill, George F.: *See*—
Farrell, Christopher J.; Hlobil, Thomas; and Nahill, George F., 4,940,158, Cl. 220-258.000.
Naito, Seishi; Tanabe, Shuji; and Nakashima, Toru, to Glory Kogyo Kabushiki Kaisha. Method and device for measuring characteristic magnetic distribution of a magnetic thin film using a magnetic head. 4,940,938, Cl. 324-212.000.
Nakae, Hiroyuki: *See*—
Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, 4,940,851, Cl. 501-56.000.
Nakagawa, Alvin H.: *See*—
McKee, Bobby D.; and Nakagawa, Alvin H., 4,940,878, Cl. 219-121.640.
Nakaguti, Osamu: *See*—
Shimazaki, Norihiko; Hemmi, Keiji; Nakaguti, Osamu; Miyazaki, Yoshio; and Hashimoto, Masashi, 4,940,709, Cl. 514-253.000.
Nakaji, Nobuo; Kojima, Hideki; and Tachibana, Ryoichi, to Toppan Printing Co., Ltd.; Mitsubishi Rayon Engineering Co., Ltd.; and Harima Chemial Industrial Co., Ltd. Apparatus for separating heavy metals from a ferric chloride waste fluid. 4,940,337, Cl. 366-148.000.
Nakamichi Corporation: *See*—
Chida, Naomichi; and Watanabe, Akiyoshi, 4,941,138, Cl. 369-44.410.
Nakamoto, Yakka; and Mori, Toshihiko, to Nippon Carbon Co., Ltd. Method of melting and/or refining metals and cooling device for the graphite electrode used for the same. 4,941,149, Cl. 373-96.000.
Nakamura, Kenichi: *See*—
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 4,940,119, Cl. 188-73.310.
Nakamura, Takashi, to Fuji Photo Film Co., Ltd. Photosensitive material processing apparatus. 4,941,008, Cl. 354-320.000.
Nakashima, Kunimichi: *See*—
Kawasaki, Hisamitsu; Nakashima, Kunimichi; Araki, Kazunori; and Mizuno, Tsuyoshi, 4,939,834, Cl. 29-568.000.
Nakashima, Toru: *See*—
Naito, Seishi; Tanabe, Shuji; and Nakashima, Toru, 4,940,938, Cl. 324-212.000.
Nakaski, Eiji; and Igarashi, Yasuo, to Sumitomo Rubber Industries, Ltd. Run-flat tire and rim assembly for ATV. 4,940,069, Cl. 152-544.000.
Nakata, Yoshinori: *See*—
Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,940,684, Cl. 502-178.000.
Nakayama, Hiroki: *See*—
Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.
Nakazawa, Takuichiro: *See*—
Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, 4,941,085, Cl. 364-200.000.
Nalco Chemical Company: *See*—
Huang, Shu-Jen; and Scheimann, David W., 4,940,491, Cl. 134-38.000.
Namsung Electronics Corp.: *See*—
Lee, Jong D., 4,940,414, Cl. 439-131.000.
Naoi, Masayuki: *See*—
Kuramatsu, Masayuki; Koboshi, Shigeharu; Goto, Nobutaka; Naoi, Masayuki; and Fujisawa, Yasuhiro, 4,941,006, Cl. 354-299.000.
Nardi, Dante; Leonardi, Amedeo; Catto, Alberto; and Graziani, Gabriele, to Recordati, S.A., Chemical and Pharmaceutical Company. Antihypertensive N-piperazinylalkanoylanilides. 4,940,711, Cl. 514-255.000.
National Research Development Corporation: *See*—
Schram, Cornelius J., 4,941,135, Cl. 367-150.000.
National Semiconductor Corporation: *See*—
Cote, James H.; Ekberg, Jurgen; Cleevely, Bruce T.; and George, Harry M., 4,940,156, Cl. 220-22.300.
Small, J. Barry; and Buynoski, Matthew S., 4,940,671, Cl. 437-31.000.
National Starch and Chemical Investment Holding Corporation: *See*—
De Wacker, Dennis R.; and Rosenberg, Leon, 4,940,741, Cl. 524-47.000.
Natsume, Takeshi: *See*—
Sakai, Jun; and Natsume, Takeshi, 4,940,610, Cl. 427-355.000.
Nawa, Hiroshi: *See*—
Suzuki, Saburo; Nawa, Hiroshi; and Ito, Sadao, 4,940,285, Cl. 297-473.000.
Naylor, Jimmy R.; Burt, Rodney T.; and Miller, Tony D., to Burr-Brown Corporation. Dual analog-to-digital converter with single successive approximation register. 4,940,981, Cl. 341-161.000.
Nazaryan, Sampson. Pool water sensor with an extendible pronged probe for determining pH and chlorine levels. 4,940,946, Cl. 324-438.000.
NCR Corporation: *See*—
Horst, William R.; and Hale, William J., 4,941,205, Cl. 455-605.000.
Taylor, Billy K., 4,941,157, Cl. 375-121.000.
Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, to Noxso Corporation. Sorbent and processes for removing nitrogen oxides, sulfur oxides and hydrogen sulfide from gas streams. 4,940,569, Cl. 423-239.000.
Nebe, Juergen P.: *See*—
Alteepping, Josef; and Nebe, Juergen P., 4,940,736, Cl. 521-98.000.
NEC Corporation: *See*—
Hayano, Shin-ichiro, 4,941,141, Cl. 370-58.100.
Ide, Motoki; and Sato, Toshifumi, 4,940,975, Cl. 340-825.440.
Kobayashi, Kenichi, 4,941,146, Cl. 372-45.000.
Mizukami, Toshihiko, 4,941,144, Cl. 371-5.500.
Ohbo, Masahiro, 4,941,052, Cl. 358-213.150.
Neff, David V.: *See*—
Amra, Lutfi H.; Byrne, Thomas M., Jr.; Martin, Harvey; Mordue, George S.; and Neff, David V., 4,940,384, Cl. 415-121.200.
Neidiffer, Fred; Fox, Charles E.; and Fox, Patsy E. Aluminum cleaning composition and process. 4,940,493, Cl. 134-3.000.
Nelson, Jimmy L.: *See*—
Tortorici, Frank J.; and Nelson, Jimmy L., 4,940,744, Cl. 524-437.000.
Nelson, Michael D.; Wong, Heimen; and Trana, Roger M., to John Fluke Mfg. Co., Inc. Instrument having flexible stand. 4,940,204, Cl. 248-688.000.
Nelson, Richard D.; Gupta, Omkarnath R.; and Herrell, Dennis J., to Microelectronics and Computer Technology Corporation. Fluid heat exchanger for an electronic component. 4,940,085, Cl. 165-80.300.
Nelson, Robert J.: *See*—
Karger, Barry L.; and Nelson, Robert J., 4,940,883, Cl. 219-200.000.
Nemoto, Hiroshi; Umemoto, Koichi; and Kawasaki, Shinji, to NGK Insulators, Ltd. Highly densified voltage non-linear resistor and method of manufacturing the same. 4,940,960, Cl. 338-13.000.
Nemoto, Mitsugu: *See*—
Ohmura, Atsuo; Koiso, Jun-ichi; Ishii, Kohji; and Nemoto, Mitsugu, 4,941,022, Cl. 355-298.000.
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, to Electricite de France (National Service). Method and device to measure the lithium concentration in the primary cooling circuit of a nuclear reactor. 4,941,112, Cl. 364-527.000.
Nerurkar, Vishnu W.: *See*—
Aubert, Donald E.; Wu, You-Sun; and Nerurkar, Vishnu W., 4,940,954, Cl. 332-103.000.
Ness, Karen M. M.: *See*—
Marshall, John; Raven, Anthony L.; Welford, Walter T.; and Ness, Karen M. M., 4,941,093, Cl. 364-413.010.
Neuburger, Glen G.: *See*—
Johnson, Dennis C.; and Neuburger, Glen G., 4,939,924, Cl. 73-61.10C.
Neumann, Peter: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.
Aumueller, Alexander; Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,940,742, Cl. 524-93.000.
Nevill, David J.; and Steck, Bernhard, to Ciba-Geigy Corporation. Microbicidal compositions. 4,940,720, Cl. 514-383.000.
Nevill, David J.; and Steck, Bernhard, to Ciba-Geigy Corporation. Microbicidal compositions. 4,940,721, Cl. 514-383.000.
Newman, Kenneth R., to Dowell Schlumberger Incorporated. Deployment/retrieval method and apparatus for well tools used with coiled tubing. 4,940,095, Cl. 166-378.000.
Newman, Neil A., to Brunswick Corporation. Marine drive system with inboard mounted engine and depending drive unit. 4,940,436, Cl. 440-112.000.
Ng, Yee S.: *See*—
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tschang, Pin S.; and Zeise, Eric K., 4,941,004, Cl. 346-160.000.
NGK Insulators, Ltd.: *See*—
Adachi, Masakazu; and Fukao, Kaname, 4,940,843, Cl. 264-65.000.
Nemoto, Hiroshi; Umemoto, Koichi; and Kawasaki, Shinji, 4,940,960, Cl. 338-13.000.
Ogura, Koji; and Miyahara, Kazuhiro, 4,940,408, Cl. 432-137.000.
Oki, Shuichiro; and Ishiguro, Fujio, 4,940,528, Cl. 204-427.000.
Takahashi, Tomonori, 4,940,680, Cl. 501-97.000.
Nguti, Tallam I. Bed attachment and piece of furniture device. 4,940,286, Cl. 297-429.000.
Nguyen, Tuan K.; and Balzano, Quirino. Balanced low profile hybrid antenna. 4,940,992, Cl. 343-803.000.
Nichols, Joseph W., to American Advantage Company. Electronic sight having a larger horizontal viewing field than a vertical viewing field and method of making same. 4,940,324, Cl. 356-247.000.
Nicola, William J.; and Reichmann, Wolfgang W., to Mobay Corporation. Foam laminates which include ASTM E-84 class I rated foams. 4,940,632, Cl. 428-318.400.
Nihart, James D.; and Prabhakar, Samuel M., to International Business Machines Corporation. Hand-held tester for communications ports of a data processor. 4,941,115, Cl. 364-580.000.
Nihon Musen Kabushiki Kaisha: *See*—
Maeda, Takamasa; and Ishikawa, Hisashi, 4,941,207, Cl. 455-617.000.
Nihon Plast Co., Ltd.: *See*—
Kaneko, Kazuhiro, 4,939,951, Cl. 74-552.000.

Nihon Tokushu Noyaku Seizo K.K.: *See—*
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Niki, Etsuko; Niki, Motohiro; Lee, Kap J.; Niki, Misako; and Niki, Mieko. Cage, especially for small experimental animals. 4,940,017, Cl. 119-18.000.

Niki, Hiroshi: *See—*
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,941,002, Cl. 346-160.000.

Niki, Mieko: *See—*
Niki, Etsuko; Niki, Motohiro; Lee, Kap J.; Niki, Misako; and Niki, Mieko, 4,940,017, Cl. 119-18.000.

Niki, Misako: *See—*
Niki, Etsuko; Niki, Motohiro; Lee, Kap J.; Niki, Misako; and Niki, Mieko, 4,940,017, Cl. 119-18.000.

Niki, Motohiro: *See—*
Niki, Etsuko; Niki, Motohiro; Lee, Kap J.; Niki, Misako; and Niki, Mieko, 4,940,017, Cl. 119-18.000.

Nilsson, Nils-Joel A.: *See—*
Lindgren, Kent O.; Danielsson, Sven E.; Johnsson, Tommy M.; and Nilsson, Nils-Joel A., 4,940,303, Cl. 156-279.000.

Nippon Carbon Co., Ltd.: *See—*
Nakamoto, Yakka; and Mori, Toshihiko, 4,941,149, Cl. 373-96.000.

Nippon Eater Co., Ltd.: *See—*
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.

Nippon Gakki Seizo Kabushiki Kaisha: *See—*
Suzuki, Hideo, 4,939,973, Cl. 84-605.000.
Taguchi, Hanzo; Mantani, Rokurota; Murayama, Masatosi; and Nishino, Toshihiro, 4,939,969, Cl. 84-719.000.

Nippon Shokubai Kagaku Kogyo Co., Ltd.: *See—*
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Nippon Thompson Co., Ltd.: *See—*
Amano, Juichi, 4,940,339, Cl. 384-25.000.

Nippondenso Co., Ltd.: *See—*
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Yoyji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, 4,939,867, Cl. 49-349.000.

Nishida, Kozi: *See—*
Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, 4,940,778, Cl. 528-481.000.

Nishii, Michiharu; Tada, Yoshihiko; and Mizuno, Genji, to Aisin Seiki Kabushiki Kaisha. Hydraulic braking system. 4,940,290, Cl. 303-6.010.

Nishimura, Kozo: *See—*
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.

Nishimura, Kunio: *See—*
Iijima, Hitoshi; and Nishimura, Kunio, 4,940,665, Cl. 435-187.000.

Nishimura, Shinji, to Mitsubishi Denki Kabushiki Kaisha. Charging generator apparatus. 4,940,928, Cl. 322-28.000.

Nishino, Toshihiro: *See—*
Taguchi, Hanzo; Mantani, Rokurota; Murayama, Masatosi; and Nishino, Toshihiro, 4,939,969, Cl. 84-719.000.

Nishio, Yukio: *See—*
Kurita, Kaoru; and Nishio, Yukio, 4,940,419, Cl. 439-271.000.

Nissan Motor Co., Ltd.: *See—*
Asano, Hiroshi; and Ishii, Shigeru, 4,939,957, Cl. 74-866.000.
Hayasaki, Koichi, 4,939,958, Cl. 74-867.000.
Imaseki, Takashi; and Kobari, Yuji, 4,941,095, Cl. 364-424.050.
Konishi, Masaaki, 4,940,273, Cl. 296-97.600.
Miki, Hiroyuki; and Kawakami, Yasushi, 4,940,275, Cl. 296-37.800.
Sugano, Kazuhiko, 4,939,955, Cl. 475-278.000.
Takizawa, Satoshi, 4,939,956, Cl. 74-858.000.
Ueno, Shuichi, 4,940,254, Cl. 280-808.000.

Nissan Shatai Company, Limited: *See—*
Takenaka, Yasushi; Sugiyama, Takeshi; and Kajita, Shunsuke, 4,940,083, Cl. 165-42.000.

Nisshin Steel Company Ltd.: *See—*
Takeshima, Eiki, 4,940,523, Cl. 204-192.120.

Nissler, Siegfried; and Radomirevic, Miroslav, to Autopan Heimerdinger & Stabler GmbH & Co. Apparatus for processing photographic material to be developed. 4,941,007, Cl. 354-320.000.

Nixdorf Computer AG: *See—*
Weigel, Peter; and Holland-Letz, Guenter, 4,940,223, Cl. 271-181.000.

NKK Corporation: *See—*
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

Noce, Louis O., to Mallinckrodt, Inc. Inflation device for balloon catheter. 4,940,459, Cl. 604-98.000.

Noell GmbH: *See—*
Krieger, Friedrich, 4,941,106, Cl. 364-513.000.

Nogami, Yoshio; Matsuo, Yoshihiro; Fujii, Takayuki; and Urashi, Seiichi, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle. 4,940,111, Cl. 180-219.000.

Nohara, Hideko: *See—*
Hirai, Hidematsu; Hanada, Toshiro; Yamanishi, Kazuhiko; and Nohara, Hideko, 4,940,660, Cl. 435-7.000.

Nolan, J. Paul: *See—*
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.

Noma Outdoor Products Inc.: *See—*
Stittle, Kenneth W., 4,939,948, Cl. 74-473.00R.

Noordman, Maarten: *See—*
Smalley, Robert J.; and Noordman, Maarten, 4,939,922, Cl. 73-10.000.

Norand Corporation: *See—*
Sojka, Marvin L., 4,940,974, Cl. 340-825.080.

Nordin, Harald E. Method and apparatus for making dental jaw models. 4,940,409, Cl. 433-74.000.

Nordson Corporation: *See—*
Zimmerman, Richard J.; Barnett, Phillip R.; and Suter, Larry, 4,940,012, Cl. 118-301.000.

Norris, Philip R.: *See—*
Cardoos, Nicholas, Jr.; Decker, Stephen; Norris, Philip R.; and Plummer, Lawrence, 4,941,000, Cl. 346-145.000.

North American Philips Corporation: *See—*
Rehkopf, Charles H.; Reigel, Franklin G.; and Chung, Samuel S., 4,940,440, Cl. 445-5.000.

North American Refractories Company: *See—*
Hyde, Jack, 4,940,081, Cl. 165-9.100.

Northeastern University: *See—*
Karger, Barry L.; and Nelson, Robert J., 4,940,883, Cl. 219-200.000.

Novinsky, Steven. Aerodynamic flying disc with weighted insert. 4,940,441, Cl. 446-46.000.

Noxso Corporation: *See—*
Neal, Lewis G.; Haslbeck, John L.; and Tseng, Hsiaopin, 4,940,569, Cl. 423-239.000.

NTN Corporation: *See—*
Hattori, Kenji, 4,940,937, Cl. 324-207.220.

NTN Toyo Bearing Co., Ltd.: *See—*
Kawashima, Kazuki; Yasui, Makoto; Hayakawa, Hisashi; and Imoto, Masayuki, 4,940,447, Cl. 474-110.000.

Nulliner, Cynthia M.: *See—*
Edelman, Paul F.; and Nulliner, Cynthia M., 4,941,196, Cl. 383-5.000.

N.V. Bekaert S.A.: *See—*
Reinle, Erwin; and Van de Loock, Guido, 4,939,881, Cl. 52-565.000.

Nyberg, Christopher A.; Jackson, James G.; and Brdicko, Jan, to Arc Sonics Inc. Sonic generator. 4,941,134, Cl. 367-142.000.

O-I Neg TV Products, Inc. Formerly known as Owens-Illinois Television Products, Inc.): *See—*
Miller, John W. V.; and Miller, Peter S., 4,941,191, Cl. 382-54.000.

Obayashi, Akira: *See—*
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.

O'Connor, David F.; Dickover, Wesley; and Tilidetzke, Steven J., to Checkrobot Inc. Unattended checkout system and method. 4,940,116, Cl. 186-61.000.

Odbert, Larry E. Electrical plug accessory. 4,940,424, Cl. 439-369.000.

Ogawa, Sumitaka: *See—*
Kano, Kouji; Ogawa, Sumitaka; Sano, Minoru; and Sakano, Masahiro, 4,940,421, Cl. 439-273.000.

Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, to Canon Kabushiki Kaisha. Flash device for a camera. 4,941,070, Cl. 362-3.000.

Ogden-Martin Systems, Inc.: *See—*
Kubin, Peter Z.; and Stepan, Jiri E., 4,940,010, Cl. 110-233.000.

Ogren, Warren. Hood glare shield. 4,940,274, Cl. 296-97.700.

Ogura, Koji; and Miyahara, Kazuhiro, to NGK Insulators, Ltd. Tunnel kiln. 4,940,408, Cl. 432-137.000.

Ogura, Mitsuru, to Sharp Kabushiki Kaisha. Image forming apparatus. 4,941,014, Cl. 355-27.000.

Ohashi, Masashi: *See—*
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Ohbo, Masahiro, to NEC Corporation. Image signal processor with noise elimination circuit. 4,941,052, Cl. 358-213.150.

Ohgawara, Toshifumi: *See—*
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.

Ohguchi, Masakatsu: *See—*
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, fumikazu; and Ohguchi, Masakatsu, 4,940,560, Cl. 264-211.000.

Ohlmeyer, Manfred; and Benzel, Martin, to Kernforschungszentrum Karlsruhe GmbH. Apparatus for catalytically reducing noxious substances in flue gas. 4,940,567, Cl. 422-173.000.

Ohmine, Toshimitsu; Honda, Takaaki; and Akagawa, Keiiti, to Kabushiki Kaisha Toshiba. Exhaust processing apparatus. 4,940,213, Cl. 266-152.000.

Ohmura, Atsuo; Koiso, Jun-ichi; Ishii, Kohji; and Nemoto, Mitsugu, to Konica Corporation. Toner recovery device. 4,941,022, Cl. 355-298.000.

Ohshima, Kazuhide; and Suzuki, Nobukazu, to Sumitomo Metal Industries, Ltd. Zn-Ni alloy-plated steel sheet with improved impact adhesion. 4,940,639, Cl. 428-659.000.

Ohsumi, Katsumi: *See—*
Aizawa, Motohiro; Ohsumi, Katsumi; Honda, Takashi; and Itow, Hisao, 4,940,564, Cl. 376-306.000.

Ohta, Mitsuru: *See—*
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, 4,940,643, Cl. 430-108.000.

Ohta, Yukio: *See—*
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.

Ohtani, Masami: *See—*
Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, 4,940,778, Cl. 528-481.000.

Oil Dynamics, Inc.: *See—*
Wilson, Brown L., 4,940,911, Cl. 310-87.000.

Oiyama, Iwao: *See—*
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.

Oka, Hiroyuki: *See—*
Fujitani, Mitsuhiro; Oka, Hiroyuki; and Hirano, Seiji, 4,940,430, Cl. 439-686.000.

Okada, Ken-ichi; and Kasahara, Hideo, to Asahi Kasei Kogyo Kabushiki Kaisha. Polyphenylene ether resin composition. 4,940,753, Cl. 525-68.000.

Okada, Mitsuhiko: *See—*
Inui, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, 4,940,446, Cl. 474-91.000.

Okazaki, Yukio: *See—*
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.

O'Keefe, Kevin M. Tile and marble cutting saw apparatus and method. 4,940,038, Cl. 125-13.010.

OKI Electric Industry Co., Ltd.: *See—*
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; and Komori, Chihiro, 4,940,343, Cl. 400-124.000.
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.
Shimizu, Makoto; and Konishi, Hiroshi, 4,940,418, Cl. 439-260.000.

Oki, Shuichiro; and Ishiguro, Fujio, to NGK Insulators, Ltd. Oxygen sensor elements. 4,940,528, Cl. 204-427.000.

Okuda, Naoki: *See—*
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Okuda, Shozoh: *See—*
Inui, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, 4,940,446, Cl. 474-91.000.

Okuno Chemical Industry Co., Ltd.: *See—*
Kawagishi, Shigemitsu; and Kita, Toshiyuki, 4,940,608, Cl. 427-259.000.

Okutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, to Agency of Industrial Science and Technology, President of. Method for preparing a catalyst supported on silicon carbide or silicon nitride. 4,940,684, Cl. 502-178.000.

Okutomi, Tsutomu: *See—*
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.

Oldham, David M.: *See—*
Kulakowski, John E.; Means, Rodney J.; Oldham, David M.; and Tayefeh, Morovat, 4,941,139, Cl. 369-54.000.

Olsen, Donald G.: *See—*
Lien, Neil C.; and Olsen, Donald G., 4,940,087, Cl. 166-88.000.

Olsen, Orrie C.; and Santina, Peter F., to Santina Water Company. Method for removing toxic metals from agricultural drain water. 4,940,549, Cl. 210-695.000.

Olshansky, Robert; and Lanzisera, Vincent, to GTE Laboratories Incorporated. High performance subcarrier multiplexed optical communication system with modulation index exceeding unity. 4,941,208, Cl. 455-618.000.

Olson, Daniel H., to Snyder Laboratories, Inc. Irrigation system for use during arthroscopy. 4,940,457, Cl. 604-30.000.

Olympus Optical Co., Ltd.: *See—*
Inabata, Tatsuo, 4,941,012, Cl. 354-478.000.
Sakuma, Hajime; Sasaki, Toshiyuki; and Komatsu, Katsumi, 4,939,925, Cl. 73-61.400.

Omega Corporation: *See—*
Miller, Harry, 4,939,851, Cl. 36-3.00B.

Omron Tateisi Electronics Co.: *See—*
Igarashi, Kimio; Uchida, Yasuo; and Matsui, Kenji, 4,941,181, Cl. 382-1.000.

Omura, Kuniyoshi: *See—*
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.

Oneac Corporation: *See—*
McCartney, Andrew; and McCartney, Thomas, 4,940,947, Cl. 324-613.000.
McCartney, Thomas; and Lace, Melvin A., 4,941,063, Cl. 361-119.000.

O'Neill, Justin T. High performance flame and smoke foam-barrier-foam-facing acoustical composite. 4,940,112, Cl. 181-290.000.

O'Neill, Stephen P., to General Motors Corporation. Electrophoretic painting apparatus. 4,940,526, Cl. 204-300.0EC.

Onishi, Masayoshi: *See—*
Yasukawa, Takeshi; and Onishi, Masayoshi, 4,941,098, Cl. 364-426.040.

Oniwa, Naoyuki: *See—*
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

Ono, Hisao: *See—*
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.

Ono, Shoichi; and Kobayashi, Atsuhito. Method and apparatus for visual indication of optical alignment of photoelectric switch. 4,940,889, Cl. 250-214.00R.

Ono, Takuro; Aoyama, Noboru; and Morinaga, Kaoru, to Kabushiki Kaisha Toshiba. Optical disc player. 4,941,140, Cl. 369-264.000.

Onozuka, Haruo: *See—*
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.

Ooi, Boon Teck, to Royal Institution for the Advancement of Learning, The. Pulse width modulation power transmission system. 4,941,079, Cl. 363-132.000.

Ooniwa, Naoyuki: *See—*
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.

Oono, Katuhisa: *See—*
Yokosouchi, Teruo; Karasawa, Takumi; and Oono, Katuhisa, 4,940,439, Cl. 445-5.000.

Ootsuka, Shigeharu, to Mitsubishi Denki Kabushiki Kaisha. Polarized electromagnetic apparatus. 4,940,958, Cl. 335-230.000.

Opheij, Willem G.; and Braat, Josephus J. M., to U.S. Philips Corporation. Optical scanning device, mirror objective suitable for use in said device and optical write and/or read apparatus provided with said device. 4,940,890, Cl. 250-216.000.

Orasche, Hermann: *See—*
Rieger, Johann; and Orasche, Hermann, 4,940,183, Cl. 238-310.000.

Orion Industries, Inc.: *See—*
Leslie, Samuel A.; and Gordon, Robert T., 4,941,200, Cl. 455-17.000.

Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., to Procter & Gamble Company, The. Sucrose fatty acid ester compositions and shortenings and margarines made therefrom. 4,940,601, Cl. 426-601.000.

Osborn, Harold L.; Mondek, Matthew H.; Hervat, John C.; and Whipple, Roger B., to Outboard Marine Corporation. Marine propulsion device. 4,940,435, Cl. 440-89.000.

Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, to Hitachi, Ltd. Semiconductor memory device. 4,941,129, Cl. 365-230.030.

Osono, Katuo; and Maejima, Masaaki, to King Jim Co., Ltd. Holder for paper-keeping bags. 4,940,353, Cl. 402-79.000.

Ostman, Leif T., to STFI. Measurement of the properties of a web in paper production. 4,939,929, Cl. 73-159.000.

Ota, Hideo: *See—*
Mishima, Tadaaki; Kanasaki, Morio; Takatoo, Masao; and Ota, Hideo, 4,941,192, Cl. 382-54.000.

Otis Engineering Corporation: *See—*
Cox, Don C., 4,940,118, Cl. 188-67.000.

OTO MILLS S.p.A.: *See—*
Chezzi, Aleardo, 4,939,919, Cl. 72-181.000.

Ott, Howard L.; and Palm, Steven A., to Westinghouse Electric Corp. Steam generator upper support having thermal displacement compensation. 4,940,025, Cl. 122-510.000.

Ott, Karl-Heinz: *See—*
Eichenauer, Herbert; Lindner, Christian; Ott, Karl-Heinz; and Braese, Hans-Eberhard, 4,940,747, Cl. 524-504.000.

Otto Engineering, Inc.: *See—*
Roeser, John O., 4,941,197, Cl. 384-44.000.

Otto, Torsten: *See—*
Bergenstoff, Hans; and Otto, Torsten, 4,941,179, Cl. 381-68.400.

Outboard Marine Corporation: *See—*
Osborn, Harold L.; Mondek, Matthew H.; Hervat, John C.; and Whipple, Roger B., 4,940,435, Cl. 440-89.000.

OV'Action S.A.: *See—*
Hauton, Francois; Dumas, Frederic; Bouttemy, Franck; and Huc, Christian, 4,940,866, Cl. 219-10.55A.

Ovaska, Seppo, to Kone Elevator GmbH. Procedure for the tuning of the position controller of an elevator. 4,940,117, Cl. 187-101.000.

Owens-Illinois Closure Inc.: *See—*
Fillmore, William E.; and Fuchs, Timothy J., 4,940,167, Cl. 222-153.000.

Oxley Developments Company Limited: *See—*
Chambers, Jeffrey; Armistead, Trevor; and Frodsham, John C., 4,940,429, Cl. 439-608.000.
Morris, Michael; and Vickers, John, 4,940,849, Cl. 428-209.000.

Oyama, Kiyotaka: *See*—
Matsuba, Takao; Kubo, Masashige; Kagawa, Takumi; Oyama, Kiyotaka; and Kawabata, Koji. 4,940,802, Cl. 548-462.000.

Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, to Research Development Corporation of Japan; Hirai, Toshio; Masumoto, Tsuyoshi; and Furukawa Electric Co., Ltd., The. Membrane for use in X-ray mask and method for preparing the same. 4,940,851, Cl. 501-56.000.

Ozawa, Takashi: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi. 4,941,018, Cl. 355-245.000.

Ozono, Kazuyuki: *See*—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio. 4,940,222, Cl. 271-127.000.

Pac-Fasteners, a Michigan partnership: *See*—
Reynolds, Richard L., 4,940,377, Cl. 411-432.000.

Pacesetter Infusion, Ltd.: *See*—
Gorton, Lanny A.; Pelmulder, John P.; Konopka, April A.; and Bloom, William G., 4,940,399, Cl. 417-415.000.

Pacific Products: *See*—
Young, John N., 4,940,194, Cl. 242-288.000.

Paduano, Ann; and Paduano, Jerome G. Method of electrolysis. 4,940,466, Cl. 606-36.000.

Paduano, Jerome G.: *See*—
Paduano, Ann; and Paduano, Jerome G., 4,940,466, Cl. 606-36.000.

Paessens, Arnold: *See*—
Boshagen, Horst; Junge, Bodo; Paessens, Arnold; and Schuller, Matthias, 4,940,705, Cl. 514-227.800.

Paik, Sanghoon; and Hong, Seokwon, to SamSung Electronics Co., Ltd. Insulating food items wrapped in metallic foil from a grid in a microwave oven. 4,940,868, Cl. 219-10.55E.

Pailthorp, Robert M.; Goetz, Howard V.; Bortnem, Mark A.; and Edson, Bruce E., to Electro Scientific Industries, Inc. Light beam positioning system. 4,941,082, Cl. 364-167.010.

Pajor, Aniko : *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin. 4,940,794, Cl. 546-13.000.

Palm, Steven A.: *See*—
Ott, Howard L.; and Palm, Steven A., 4,940,025, Cl. 122-510.000.

Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, to Chinoin Gyogyszer es Vegyeszeti Termekek Gyara Rt. 2-amino-tetrahydro-isoquinolene derivatives and a process for the preparation thereof and pharmaceutical compositions containing same. 4,940,716, Cl. 514-307.000.

Pappas, Peter G.: *See*—
Cengel, John A.; and Pappas, Peter G., 4,940,552, Cl. 252-51.50A.

Paramo Tools Group Ltd., The: *See*—
Gorst, Alan, 4,939,839, Cl. 30-125.000.

Parandoosh, Ladan A.: *See*—
Johnson, Edward R.; Parandoosh, Ladan A.; and Lutz, Joseph F., 4,941,198, Cl. 455-9.000.

Park, Chul. Tank type liquid vacuum cleaner. 4,939,809, Cl. 15-328.000.

Parker, Robert McD. Garment supporting system including tie therefor. 4,940,174, Cl. 224-257.000.

Parrish, William R.: *See*—
Drake, Charles A.; Parrish, William R.; and Lee, Roy C., 4,940,833, Cl. 585-868.000.

Parsi, Edgardo J.: *See*—
Goldstein, Arthur J.; and Parsi, Edgardo J., 4,940,667, Cl. 436-157.000.

Partenheimer, Walter: *See*—
Yokelson, Howard B.; Partenheimer, Walter; and Gipe, Robert, 4,940,810, Cl. 556-438.000.

Passafiume, John E.: *See*—
Akers, Albert L.; Carpenter, Robert M.; Freeman, William D.; and Passafiume, John E., 4,940,348, Cl. 400-624.000.

Pastorino, Ronald L.; and Bock, Lawrence A., to Witco Corporation. Dispersions and the preparation of foamed resins therefrom. 4,940,732, Cl. 521-69.000.

Patel, Parashar, to Phoenix Software Development Co. Vision system and method for automated painting equipment. 4,941,182, Cl. 382-1.000.

Paton, Anthony D.; Temple, Stephen; and Shepherd, Mark R. Drop-on-demand printhead. 4,940,996, Cl. 346-140.00R.

Patsiokas, Stelios J.; Moore, Morris A.; and Johnson, Brian K. A., to Motorola, Inc. Two-way radio communication system having selectable operating modes. 4,941,203, Cl. 455-53.000.

Patton, Douglas M.: *See*—
Fiorentino, Frank S.; and Patton, Douglas M., 4,939,800, Cl. 4-620.000.

Patton, Robert L.: *See*—
Flanigen, Edith M.; Lok, Brent M.; Patton, Robert L.; and Wilson, Stephen T., 4,940,570, Cl. 423-306.000.

Paul Forkardt GmbH & Co., KG: *See*—
Grund, Gerhard; and Kempken, Rainer, 4,939,966, Cl. 82-165.000.

Paul Wurth S.A.: *See*—
Solvi, Marc, 4,940,005, Cl. 110-182.500.

Paulin, Daniel: *See*—
Baillet, Alain; Loisel, Francois; and Paulin, Daniel, 4,940,163, Cl. 221-193.000.

Paulshus, Bjorn; and Hawley, Phil. Device in a flexible tension leg. 4,940,361, Cl. 405-224.000.

Paulshus, Bjorn; and Hawley, Phil. Packing means for a flexible tension leg in a tension leg platform. 4,940,362, Cl. 405-224.000.

Pavone, Robert J.; Davidson, Bruce L.; and Berdat, Henry F., to Gerber Scientific Instrument Company, The. Aperture disc and method of making the same. 4,940,641, Cl. 430-5.000.

Pawliszyn, Janusz B., to Torres, Anthony R. Method and apparatus for detecting universally and selectively concentration gradients, and for deflecting a light beam in a controlled fashion. 4,940,333, Cl. 356-432.000.

Pawlowski, Georg, to Hoechst Aktiengesellschaft. Polyvinyl acetal with hydroxy aliphatic acetal groups useful in photosensitive negative working compositions. 4,940,646, Cl. 430-175.000.

PCC Airfoils, Inc.: *See*—
Jeyarajan, Arunachalam; Graham, Lawrence D.; Brokloff, John E.; and Monte, Louis H., 4,940,073, Cl. 164-361.000.

Peach State Labs, Inc.: *See*—
Moss, Thomas H., III; Sargent, Ralph R.; and Williams, Michael S., 4,940,757, Cl. 525-502.000.

Pearson, Linnea H. Electrical trailer connector retainer. 4,940,427, Cl. 439-501.000.

Pearson, Michael J.: *See*—
Finch, Stephen C.; and Pearson, Michael J., 4,940,702, Cl. 514-201.000.

Peck, Lawrence B.: *See*—
Beaton, William I.; Taylor, James L.; Peck, Lawrence B.; and Mosby, James F., 4,940,529, Cl. 208-61.000.

Peddinghaus, Carl U.: *See*—
Pfluger, Ludwig, 4,940,216, Cl. 269-32.000.

Pedersen, Harry E.; and Sorensen, Ole V., to Danfoss A/S. Articulated vehicle with hydraulic steering. 4,940,106, Cl. 180-139.000.

Peer, Roger L.; and Russ, Michael B., to UOP. Cleanup of hydrocarbon conversion system. 4,940,532, Cl. 208-138.000.

Peleg, Yigal, to Stouffer Corporation, The. Microwave composite sheet stock. 4,940,867, Cl. 219-10.55E.

Pellman, Mark A.; Kilhefner, Paul T., III; and Hahn, Terrence S., to Air Products and Chemicals, Inc. Removing pattern material from investment casting molds. 4,940,072, Cl. 164-35.000.

Pelmulder, John P.: *See*—
Gorton, Lanny A.; Pelmulder, John P.; Konopka, April A.; and Bloom, William G., 4,940,399, Cl. 417-415.000.

Peltier, Rene : *See*—
Castelain, Yves; Jaubert, Philippe; and Peltier, Rene , 4,940,382, Cl. 414-750.000.

Peninsula Engineering Group, Inc.: *See*—
Johnson, Edward R.; Parandoosh, Ladan A.; and Lutz, Joseph F., 4,941,198, Cl. 455-9.000.

Penney, Gaykord W. Device for cleaning two-stage electrostatic precipitators. 4,940,471, Cl. 55-120.000.

Penot, Alain: *See*—
Meunier, Paul-Louis; Penot, Alain; Coutellier, Jean-Marc; and Bussac, Claude, 4,939,836, Cl. 29-603.000.

Penven, Patrick H., to Asten Group, Inc. Base fabric structures for seamed wet press felts. 4,940,630, Cl. 428-234.000.

Pepper, Kenneth V., to Bemis Manufacturing Company, Inc. Toilet seat hinge. 4,939,796, Cl. 4-236.000.

Pereira, Jean-Luc: *See*—
Nepveu de Villemarceau, Christian; Pereira, Jean-Luc; Blin, Jean-Pierre; Arzel, Anne-Marie; and Livigni, Didier, 4,941,112, Cl. 364-527.000.

Perineau, Jean-Maurice; and Bachot, Jean, to Rhone-Poulenc Chimie. Electroactivated cathode materials. 4,940,524, Cl. 204-242.000.

Periou, Pierre, to Rockwell-CIM. Instruction generator for controlling the position of an element, in particular a sliding opening element of an automobile vehicle. 4,940,926, Cl. 318-603.000.

Perone, Vincent A.: *See*—
Schwirian, Richard E.; and Perone, Vincent A., 4,941,159, Cl. 376-458.000.

Peronek, Michael H.; and Jones, Robin C., to FCI, Inc. Anti-rotation method and apparatus for bottle capping machines. 4,939,890, Cl. 53-486.000.

Perry, Lonnie K.: *See*—
Ferguson, Fred S.; and Perry, Lonnie K., 4,940,092, Cl. 166-311.000.

Peter, Heinrich, to Ciba-Geigy Corporation. N,N-disubstituted ureas and processes for their manufacture. 4,940,811, Cl. 558-262.000.

Peter Lancier Maschinenbau-Hafenhuette GmbH & Co.,KG: *See*—
Vemmer, Helmut, 4,939,939, Cl. 73-862.440.

Peters, Glenn. Honey stick machine. 4,939,884, Cl. 53-127.000.

Petersen, Robert D.: *See*—
Johnson, Andrew J.; Petersen, Robert D.; and Swanson, Stephen D., 4,940,865, Cl. 219-10.55A.

Peterson, Clyde O.: *See*—
Elms, Robert T.; Peterson, Clyde O.; and Saletta, Gary F., 4,940,391, Cl. 417-12.000.

Peterson, Daniel. Telephone cord take-up reel assembly. 4,940,859, Cl. 191-12.400.

Petillo, Phillip J. Apparatus for microsurgery. 4,940,468, Cl. 606-170.000.

Petit, Nicaise; and Moisset, Jean-Claude, to Snef Electro Mecanique; and Techni Contact. Process and equipment for cleaning large electromechanical parts. 4,940,494, Cl. 134-1.000.

Petterson, William C.; Wells, Thomas A.; Cheriah, Peter; and Morgan, Stephen W., to M. W. Kellogg Company, The. Steam cracking feed gas saturation. 4,940,828, Cl. 585-652.000.
Pettigrew, Robert M.; Chambers, Stephen H.; Davies, Dafydd G.; and Crosafield, Michael D., to Scientific Generics Limited. Article detection and/or recognition using magnetic devices. 4,940,966, Cl. 340-551.000.
Pettit, George R.; and Singh, Sheo B., to Arizona Board of Regents. Cell growth inhibitory macrocyclic lactones denominated Combretastatin D-1 and Combretastatin D-2. 4,940,726, Cl. 514-450.000.
Pews, R. Garth; and Gall, James A., to Dow Chemical Company, The. Preparation of fluorophenols. 4,940,821, Cl. 568-775.000.
Pfizer Inc.: *See*—
Bick, Peter A., 4,940,731, Cl. 514-657.000.
Sarges, Reinhard, 4,940,708, Cl. 514-249.000.
Sinay, Terry G., Jr.; and Sysko, Robert J., 4,940,791, Cl. 544-237.000.
Volkmann, Robert A., 4,940,823, Cl. 568-844.000.
Walker, Frederick J.; and Melvin, Lawrence S., 4,940,712, Cl. 514-272.000.
Pfluger, Ludwig, to Peddinghaus, Carl U. Machinist's vise. 4,940,216, Cl. 269-32.000.
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tachang, Pin S.; and Zeise, Eric K., to Eastman Kodak Company. Printer apparatus. 4,941,004, Cl. 346-160.000.
Pham, Van Doan: *See*—
Thuries, Edmond; Pham, Van Doan; and Ledru, Roger, 4,940,961, Cl. 338-21.000.
Phenix Heat Pump Systems, Inc.: *See*—
Best, Jerry; Bourne, Richard C.; Hoeschele, Marc; and Bos, Willem, 4,940,079, Cl. 165-2.000.
Phillips, John A.; and Dunnett, Bruce, to Stc PLC. A/D converters. 4,940,983, Cl. 341-171.000.
Phillips Petroleum Company: *See*—
Bridges, Steven D., 4,940,831, Cl. 585-836.000.
Drake, Charles A., 4,940,829, Cl. 585-752.000.
Drake, Charles A.; Parrish, William R.; and Lee, Roy C., 4,940,833, Cl. 585-863.000.
Tooley, Patricia A.; and Kolts, John H., 4,940,686, Cl. 502-327.000.
Philpot, Terry. Shrinkwrap beverage pack. 4,940,141, Cl. 206-430.000.
Phoenix Software Development Co.: *See*—
Patel, Parashar, 4,941,182, Cl. 382-1.000.
Piatt, John A. Swim fin with harness. 4,940,437, Cl. 441-62.000.
Picker International, Inc.: *See*—
Daly, Robert E.; Sloan, Clifford E.; and Sanidad, Armisticio Z., 4,941,131, Cl. 366-167.000.
Enck, Richard S., Jr.; Hindenes, Gregg A.; and Glasgow, Ian K., 4,940,919, Cl. 313-526.000.
Pidgeon, Webster M. Method and apparatus for applying decorative coating materials to a surface. 4,940,166, Cl. 222-136.000.
Pierburg GmbH: *See*—
Kuhlen, Ernst, 4,940,397, Cl. 417-435.000.
Pieter, Reimund: *See*—
Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Pieter, Reimund, 4,940,784, Cl. 536-1.100.
Pifer, David D.: *See*—
Mason, James M.; and Pifer, David D., 4,940,581, Cl. 424-532.000.
Pilgrim, Noel L., Jr. Decorative bottle and method of fabricating. 4,940,153, Cl. 215-12.200.
Pilkington Visioncare, Inc.: *See*—
Powell, James C., 4,940,762, Cl. 526-279.000.
Pillsbury Company, The: *See*—
Yasosky, John J.; Hahn, Patricia W.; and Atwell, William A., 4,940,595, Cl. 426-243.000.
Pissiotas, Georg: *See*—
Bohner, Beat; Moser, Hans; and Pissiotas, Georg, 4,940,485, Cl. 71-96.000.
Pithouse, Kenneth B.; Kridl, Thomas A.; Triplett, James T.; and Wille, Marc, to Matsushita Electric Industrial Co., Ltd. Wraparound recovery article. 4,940,820, Cl. 428-34.900.
Pitney Bowes Inc.: *See*—
Breault, Michelle S.; and Steinmetz, John H., 4,941,091, Cl. 364-406.000.
Zeller, Claude; Mayeski, Henry A.; and Murphy, Charles F., III, 4,940,959, Cl. 338-13.000.
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., to Barrack Technology Limited. Method of operating an engine and measuring certain operating parameters. 4,940,033, Cl. 123-425.000.
Plessey Overseas Limited: *See*—
Laws, Peter G.; and Fletcher, Graham J., 4,940,948, Cl. 329-307.000.
Plough, Inc.: *See*—
Kaplan, Carl, 4,940,574, Cl. 424-59.000.
Plummer, Lawrence: *See*—
Cardoos, Nicholas, Jr.; Decker, Stephen; Norris, Philip R.; and Plummer, Lawrence, 4,941,000, Cl. 346-145.000.
Plus Logic, Inc.: *See*—
Mulder, Theodor; and Kaplinsky, Cecil H., 4,940,909, Cl. 307-465.000.
Pochmarski, Luzian: *See*—
Lugscheider, Walter; and Pochmarski, Luzian, 4,940,487, Cl. 75-384.000.
Pochopien, Kevin P.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; and White, Danny R., 4,940,679, Cl. 501-96.000.
Pocock, Terrence H.; Coumans, Peter J. M.; McNorgan, Richard M.; and Hart, George M., to Cableshare, Inc. Cable television system selectively distributing pre-recorded video and audio messages. 4,941,040, Cl. 358-86.000.
Podini, Piergiorgio. Automatic baler for bundling together individual food bags previously filled in automatic packers. 4,939,891, Cl. 53-496.000.
Poetsch, Dieter: *See*—
Massmann, Volker; and Poetsch, Dieter, 4,941,186, Cl. 382-54.000.
Pokorny, Herta M.; and Pokorny, Stefania. Folding container. 4,940,068, Cl. 150-132.000.
Pokorny, Stefania: *See*—
Pokorny, Herta M.; and Pokorny, Stefania, 4,940,068, Cl. 150-132.000.
Polando, Scott: *See*—
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Polaroid Corporation: *See*—
Cardoos, Nicholas, Jr.; Decker, Stephen; Norris, Philip R.; and Plummer, Lawrence, 4,941,000, Cl. 346-145.000.
Farrington, David L., 4,941,011, Cl. 354-430.000.
Polysar Financial Services S.A.: *See*—
Lo, Lawrence Y.; and Boulier, Paul R., 4,940,752, Cl. 525-67.000.
Ponjee, Johannes J.; Touwslager, Fredericus J.; and Camps, Ivo G. J., to U.S. Philips Corporation. PN junction passivation using methylated silyloxy groups. 4,940,673, Cl. 437-225.000.
Poore, John W.: *See*—
Mann, Brian M.; and Poore, John W., 4,940,052, Cl. 128-419.0PG.
Mann, Brian M.; and Poore, John W., 4,940,053, Cl. 128-419.0PG.
Popp-Ginsbach, Hildegard, to F.P.D. Future Patent Development Co., S.A. Spray head for use with a can containing a liquid exposed to the pressure of a propellant. 4,940,170, Cl. 222-402.100.
Porter, Robert D., to McDonnell Douglas Corporation. Multi purpose thread ring gage. 4,939,845, Cl. 33-199.00R.
Posso, Patrick, to Gefitec S.A. Case for containing and immobilizing a computer tape reel. 4,940,140, Cl. 206-405.000.
Postley, John E. Treatment for sino-nasal congestion. 4,940,728, Cl. 514-474.000.
Potucek, Martin, to Eastman Kodak Company. Non-impact dot print head with reset. 4,941,001, Cl. 346-154.000.
Powell, James C., to Pilkington Visioncare, Inc. Oxygen permeable lens with hydrolyzable silicon group. 4,940,762, Cl. 526-279.000.
PPG Industries, Inc.: *See*—
Gillery, Frank H., 4,940,884, Cl. 219-203.000.
Prabhakar, Samuel M.: *See*—
Nihart, James D.; and Prabhakar, Samuel M., 4,941,115, Cl. 364-580.000.
Precision Screen Machines, Inc.: *See*—
Szarka, Sandor, 4,939,991, Cl. 101-115.000.
Predmore, Roamer: *See*—
Hermansen, Ralph D.; Sutherland, Thomas H.; and Predmore, Roamer, 4,940,633, Cl. 428-324.000.
Prentice, Glenn W.: *See*—
Alexander, James R.; Johnson, Acie G.; and Prentice, Glenn W., 4,939,863, Cl. 42-103.000.
Preston, David M.; and Haefner, Donald R., to Eaton Corporation. Split arm throttle cable intervention device. 4,940,109, Cl. 180-197.000.
Prestorp AB: *See*—
Lindgren, Kent O.; Danielsson, Sven E.; Johnsson, Tommy M.; and Nilsson, Nils-Joel A., 4,940,503, Cl. 156-279.000.
Proc Products, Inc.: *See*—
Ritchie, John P., 4,940,287, Cl. 298-23.00R.
Procter & Gamble Company, The: *See*—
Coveney, Leila D.; Jones, Linda C.; and Maney, Jerry R., 4,940,695, Cl. 514-57.000.
Iding, Stephen H.; and Dirksing, Robert S., 4,939,795, Cl. 4-228.000.
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.
Spendel, Wolfgang U., 4,940,513, Cl. 162-112.000.
Professional Chemicals Corporation: *See*—
Roden, James R.; and Ingle, Gary D., 4,939,808, Cl. 15-322.000.
Roden, James R., 4,940,082, Cl. 15-321.000.
Protos Precision Systems Limited: *See*—
Spooner, Peter D.; and Scottow, Colin A., 4,939,936, Cl. 73-862.070.
Prymak, Rostislaw: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.
Pryzwansky, Katherine B.: *See*—
Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., 4,940,723, Cl. 514-396.000.
Puleston, Sidney, to Borden, Inc. Engraved printing rolls. 4,939,994, Cl. 101-348.000.
Pulse Electronics, Inc.: *See*—
Bezos, Angel P.; and Egerton, Gary W., 4,940,292, Cl. 303-81.000.
Puppe, Lothar: *See*—
Klug, Gunter; Buysch, Hans-Josef; and Puppe, Lothar, 4,940,817, Cl. 564-305.000.
Purcell, Harry: *See*—
Bull, John; Fettes, Ian; and Purcell, Harry, 4,940,233, Cl. 272-130.000.

Putnana, Peter M. H., to British Aerospace Public Limited Company. Aircraft undercarriage unit. 4,940,197, Cl. 244-102.00R.
Putzar, Roland: *See*—
Mockel, Reinhart; and Putzar, Roland, 4,940,469, Cl. 8-527.000.
Quantex Corporation: *See*—
Soltani, Peter K., 4,940,603, Cl. 427-66.000.
Queen City Group: *See*—
Hornstein, Allan S., 4,940,138, Cl. 206-218.000.
Querry, Lester R.: *See*—
Winebaum, Jacob J.; Rider, Alan J.; and Querry, Lester R., 4,941,172, Cl. 379-355.000.
Quessard, Roland: *See*—
Kant, Michel; Biedinger, Jean-Marie; Quessard, Roland; and Galko, Jacques, 4,940,912, Cl. 310-162.000.
Quinn, Candace J.: *See*—
Beall, George H.; and Quinn, Candace J., 4,940,677, Cl. 501-45.000.
Quinn, Robert J.: *See*—
Darnell, Michael J.; Hary, Joseph M.; and Quinn, Robert J., 4,941,102, Cl. 364-513.000.
R. Berchtold AG: *See*—
Vonlaethen, Benno, 4,939,915, Cl. 70-277.000.
R & C Products Pty. Limited: *See*—
Thompson, Ian A., 4,940,583, Cl. 424-195.100.
Raar, Hans, to Merlin C.T.C. Production Division Nederland B.V. Ink cassette and ink transfer roll therefor. 4,940,345, Cl. 400-195.000.
Raasch, Hans; and Straaten, Paul, to W. Schlaffhorst & Co. Spinning machine with can replacement apparatus. 4,939,895, Cl. 57-263.000.
Raber, David M. Protective control system for watercraft. 4,940,433, Cl. 440-1.000.
Rabiger, Norbert: *See*—
Vogelpohl, Alfons; and Rabiger, Norbert, 4,940,546, Cl. 210-613.000.
Rademacher, Kevin A.; Dean, Dennis R.; Dixon, Jerry L., Sr.; and Szklarz, Robert J., to ADC Telecommunications, Inc. Hot cut procedure for telecommunications network. 4,941,165, Cl. 379-1.000.
Radomirevic, Miroslav: *See*—
Nissler, Siegfried; and Radomirevic, Miroslav, 4,941,007, Cl. 354-320.000.
Ram-Line, Inc.: *See*—
Brandenburg, Ernest; and Chesnut, M. Gaines, 4,939,862, Cl. 42-88.000.
Rambaud, Philippe: *See*—
Borel, Michel; Boronat, Jean-Francois; Meyer, Robert; and Rambaud, Philippe, 4,940,916, Cl. 313-306.000.
Randall, James E.; Lemke, Ronald D.; and Mesteller, Robert A., to Stein, Inc. Adjustable cooking oven. 4,940,040, Cl. 126-21.00A.
Randes, Neil A., to Minnesota Mining and Manufacturing Company. Topical application of medicament in a binder. 4,940,579, Cl. 424-78.000.
Rank Taylor Hobson: *See*—
Mansfield, Daniel I., 4,940,895, Cl. 250-332.000.
Raschack, Manfred: *See*—
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.
Rast, Howard E., to United States of America, Navy. Automated system for measuring the strength of optical fibers. 4,940,891, Cl. 250-227.150.
Ratti, Giuseppina: *See*—
Coile, Roberto; Ratti, Giuseppina; Garavaglia, Carlo; and Mirenna, Luigi, 4,940,724, Cl. 514-397.000.
Raulfs, Friedrich-Wilhelm: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.
Raven, Anthony L.: *See*—
Marshall, John; Raven, Anthony L.; Welford, Walter T.; and Ness, Karen M. M., 4,941,093, Cl. 364-413.010.
Ravizza S.p.a.: *See*—
Botre, Francesco; and Signorini, Roberto, 4,940,793, Cl. 544-349.000.
Raychem Corporation: *See*—
Soni, Pravin, 4,940,179, Cl. 228-56.300.
Raye, Pierre: *See*—
Aebi, Gilbert; Raye, Pierre; David, Maurice J. A.; and Marianneau, Michel E. A., 4,940,369, Cl. 407-42.000.
RCA Licensing Corporation: *See*—
Leonardi, Giovanni M., 4,941,078, Cl. 363-97.000.
Rebhan, Franz. Casing for a power driven chain saw. 4,939,842, Cl. 30-386.000.
Recognition Equipment Incorp.: *See*—
Weideman, William E., 4,941,122, Cl. 364-807.000.
Recordati, S.A., Chemical and Pharmaceutical Company: *See*—
Nardi, Dante; Leonardi, Amedeo; Catto, Alberto; and Graziani, Gabriele, 4,940,711, Cl. 514-255.000.
Redmond, John P.; and Shaak, Ray N., to AMP Incorporated. High density woven wire harness assembly. 4,940,426, Cl. 439-495.000.
Reed, Alastair, to Crosfield Electronics. Image processing. 4,941,185, Cl. 382-41.000.
Reed, Delores A. Vehicle safety belt buckle cover. 4,939,824, Cl. 24-633.000.
Reed Tool Company: *See*—
Deane, John D.; Ivie, Craig R.; and Schumacher, Percy W., 4,940,099, Cl. 175-374.000.
Rees, John A. J. Turbocompounded two-stroke piston engines. 4,940,029, Cl. 123-257.000.
Reeves, Kenneth. Residential water meter with integral fire hydrant. 4,939,931, Cl. 73-201.000.
Reeves, Richard L.; and Woodland, Dennis, to Reeves & Woodland Industries. Bi-directional flexible seal. 4,940,080, Cl. 165-9.000.
Reeves & Woodland Industries: *See*—
Reeves, Richard L.; and Woodland, Dennis, 4,940,080, Cl. 165-9.000.
Regel, Erik: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.
Rehberg, Thomas R.; and Brailoff, Sam, to Mobex Corporation. Gas-fired fireplace log set. 4,940,407, Cl. 431-126.000.
Rehkopf, Charles H.; Reigel, Franklin G.; and Chung, Samuel S., to North American Philips Corporation. Weak beam scanning of cathode ray tubes. 4,940,440, Cl. 445-5.000.
Reichmann, Wolfgang W.: *See*—
Nicola, William J.; and Reichmann, Wolfgang W., 4,940,632, Cl. 428-318.400.
Reider, Paul: *See*—
Corley, Edward G.; Larsen, Robert D.; Grabowski, Edward J. J.; and Reider, Paul, 4,940,813, Cl. 560-103.000.
Reif, Heinz: *See*—
Lalvani, Prem; Lademann, Diethart; Buschmann, Hans; Reif, Heinz; and Cohnen, Walther, 4,940,653, Cl. 430-502.000.
Reigel, Franklin G.: *See*—
Rehkopf, Charles H.; Reigel, Franklin G.; and Chung, Samuel S., 4,940,440, Cl. 445-5.000.
Reim, Gerhard: *See*—
Dopheide, Dietrich; Faber, Michael; Taux, Guenter; and Reim, Gerhard, 4,940,330, Cl. 356-28.500.
Reinalda, Donald: *See*—
Janssen, Frank J.; Wilms, Coenraad H.; Reinalda, Donald; and Bruijn, Hendrik W., 4,940,827, Cl. 585-646.000.
Reinecke, Paul: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.
Reinle, Erwin; and Van de Loock, Guido, to N.V. Bekaert S.A. Reinforcing apparatus for a masonry wall, as well as masonry wall. 4,939,881, Cl. 52-565.000.
Reiser, Wolf: *See*—
Elbe, Hans-Ludwig; Reiser, Wolf; Regel, Erik; Buchel, Karl H.; Reinecke, Paul; Brandes, Wilhelm; Lurssen, Klaus; and Frohberger, Paul-Ernst, 4,940,798, Cl. 548-268.400.
Remboski, Donald J., Jr.: *See*—
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.
Rempfler, Hermann: *See*—
Muller, Urs; Tobler, Hans; Rempfler, Hermann; and Meyer, Alfred, 4,940,481, Cl. 71-76.000.
Research Development Corporation of Japan: *See*—
Oyobe, Akira; Maeda, Toshihiko; Nakae, Hiroyuki; Hirai, Toshio; and Masumoto, Tsuyoshi, 4,940,851, Cl. 501-56.000.
Retallick, William B. Air conditioner for an automobile. 4,939,902, Cl. 62-46.200.
Reuben, Ronnie. Electric heating device for mirror. 4,940,317, Cl. 350-588.000.
Revelin, Diego: *See*—
Revelin, Evaristo; Revelin, Diego; and Revelin, Fulvio, 4,939,872, Cl. 51-180.000.
Revelin, Evaristo; Revelin, Diego; and Revelin, Fulvio. Honing machine with rotating plate having at least one head which does not rotate with respect to the plate. 4,939,872, Cl. 51-180.000.
Revelin, Fulvio: *See*—
Revelin, Evaristo; Revelin, Diego; and Revelin, Fulvio, 4,939,872, Cl. 51-180.000.
Reynolds Metals Company: *See*—
Honeycutt, LeRoy, III; Key, James C.; and Moody, Herbert, III, 4,940,077, Cl. 164-463.000.
Reynolds, Richard L., to Pac-Fasteners, a Michigan partnership. Laminated nut having cage with nested fingers and method of manufacture. 4,940,377, Cl. 411-432.000.
Rheinmetall GmbH: *See*—
Zielinski, Erich, 4,939,980, Cl. 89-46.000.
Rhinehart, R. Russell: *See*—
Riggs, James B.; and Rhinehart, R. Russell, 4,940,551, Cl. 210-743.000.
Rhodes, Buck A. Method for compounding and testing patient specific monoclonal antibodies and monoclonal antibody fragments for in vivo use. 4,940,670, Cl. 436-548.000.
Rhodes, John C.; Aljoe, Ronald R.; and Ellers, Berne F., to Clean-Pak, Inc.; and Dry Forming Processes AB. Absorbent pad and method for constructing same. 4,940,621, Cl. 428-137.000.
Rhodes, Wayne T., III; and Savaria, Normand M., to James River Corporation, The. Meltblown wiper incorporating a silicone surfactant. 4,940,626, Cl. 428-198.000.
Rhone-Poulenc Chimie: *See*—
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 4,940,765, Cl. 528-15.000.
Gay, Michel; and Canivenc, Edith, 4,940,766, Cl. 528-18.000.
Perineau, Jean-Maurice; and Bachot, Jean, 4,940,524, Cl. 204-242.000.

Rhone-Poulenc Specialites Chimique: *See*—
Sauvion, Guy-Noel; Caillod, Jack; and Gourlaouen, Claire, 4,940,685, Cl. 502-263.000.
Ricci, Donato L. Low-clearance pipe lathe. 4,939,964, Cl. 82-113.000.
Riccio, Louis M.: *See*—
Bosna, Alexander A.; and Riccio, Louis M., 4,940,623, Cl. 428-158.000.
Rice, Haradon J.: *See*—
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.
Richard, Herve: *See*—
Canivenc, Edith; Forestier, Serge; Gay, Michel; Lang, Gerard; and Richard, Herve, 4,940,765, Cl. 528-15.000.
Richter, Konrad J., Sr., to Heinemann Electric Company. Flange engagement of captive tube in electromagnetic circuit breakers using half shells. 4,940,957, Cl. 335-202.000.
Richter, Roland; Mayer, Wolfram; Langen, Gunter; and Leyser, Willy, to Bayer Aktiengesellschaft; and Karl Otto Braun KG. Textile sheet-like structure with reactive resin. 4,940,047, Cl. 128-90.000.
Ricoh Company, Ltd.: *See*—
Iiyama, Kiyotaka; and Hayakawa, Kunio, 4,940,691, Cl. 503-220.000.
Ricoh Company, Ltd.: *See*—
Komai, Hiroshi; and Aoki, Hideo, 4,941,015, Cl. 355-200.000.
Rider, Alan J.: *See*—
Winebaum, Jacob J.; Rider, Alan J.; and Querry, Lester R., 4,941,172, Cl. 379-355.000.
Ridgway, David N.: *See*—
Aberson, James A.; DeFabritis, Raymond P.; Ridgway, David N.; and Vicory, William A., 4,940,307, Cl. 350-96.210.
Riebe, Jens P.: *See*—
Gode, Peter; Riebe, Jens P.; and Jeromin, Lutz, 4,940,544, Cl. 210-603.000.
Ried Ashman Manufacturing: *See*—
Riley, Bryan R., 4,940,935, Cl. 324-158.00F.
Riedmaier, Josef; Widemann, Friedrich; and Schmatelka, Bernhard, to Webasto AG Fahrzeugtechnik. Heater having a casing with an integrally cast mounting space for control components. 4,940,041, Cl. 126-110.00R.
Riegel, Herbert: *See*—
Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, 4,940,687, Cl. 502-333.000.
Rieger, Johann; and Orasche, Hermann, to Voest-Alpine Maschinenbau Gesellschaft m.b.H. Arrangement for fastening rails. 4,940,183, Cl. 238-310.000.
Rieter Machine Works, Ltd.: *See*—
Schenkel, Thomas; and Staehli, Urs, 4,939,816, Cl. 19-105.000.
Staheli, Christoph; and Staehli, Urs, 4,940,367, Cl. 406-30.000.
Riggs, James B.; and Rhinehart, R. Russell. Method for pH control. 4,940,551, Cl. 210-743.000.
Riley, Bryan R., to Ried Ashman Manufacturing. Automatic SMD tester. 4,940,935, Cl. 324-158.00F.
Ringe, Stephen J.: *See*—
Abott, Richard A.; Ringe, Stephen J.; and Keeler, Michael J., 4,940,279, Cl. 296-181.000.
Riser, Frederick M.: *See*—
DiGregrio, David; Eismin, Richard J.; and Riser, Frederick M., 4,940,545, Cl. 210-609.000.
Ritchie, John P., to Proc Products, Inc. Load enhancer for dump trucks. 4,940,287, Cl. 298-23.00R.
Ritli, Peter: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.
Ritter, Gerhard; Ritter, Klaus; Scherr, Rudolf; and Jursche, Kurt, to EVG Entwicklungs-u.Verwertungs-Gesellschaft m.b.H. Convertible single or double spot welding machine. 4,940,874, Cl. 219-87.000.
Ritter, Klaus: *See*—
Ritter, Gerhard; Ritter, Klaus; Scherr, Rudolf; and Jursche, Kurt, 4,940,874, Cl. 219-87.000.
Ritzenthaler, Hugo; and Polando, Scott, to VDO Adolf Schindling AG. Level measuring device. 4,939,932, Cl. 73-317.000.
Ritzenthaler, Hugo A.; and Haub, Martin, to VDO Adolf Schindling AG. Combination instrument. 4,939,934, Cl. 73-431.000.
Rizzuto, Anthony B. Liquid shut-off system. 4,940,861, Cl. 200-84.00R.
Road Rescue, Inc.: *See*—
DeCosse, Gary A.; and Wulff, William B., 4,941,074, Cl. 362-61.000.
Robert Bosch GmbH: *See*—
Duplat, Gerard, 4,940,036, Cl. 123-506.000.
Eckert, Konrad, 4,940,037, Cl. 123-506.000.
Heim, Hans; and Klein, Hermann-Josef, 4,940,034, Cl. 123-497.000.
Massmann, Volker; and Poetsch, Dieter, 4,941,186, Cl. 382-54.000.
Roberts, Roy D.: *See*—
Schuda, Felix; and Roberts, Roy D., 4,940,922, Cl. 315-246.000.
Robertshaw Controls Company: *See*—
Scott, Douglas R.; Goddard, Peggy L.; and Wagner, Joseph P., 4,940,915, Cl. 310-338.000.
Robeson, Lloyd M.: *See*—
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Santangelo, Joseph G., 4,940,733, Cl. 521-79.000.
Robillard, Sheryl A.: *See*—
Su, Sophia R.; Fitzpatrick, Leo F.; and Robillard, Sheryl A., 4,940,571, Cl. 423-339.000.
Rockwell-CIM: *See*—
Perlou, Pierre, 4,940,926, Cl. 318-603.000.
Rockwell International Corporation: *See*—
Bhowmik, Anup, 4,941,147, Cl. 372-94.000.
Roden, James R.; and Ingle, Gary D., to Professional Chemicals Corporation. Carpet cleaning apparatus. 4,939,808, Cl. 15-322.000.
Roden, James R., to Professional Chemicals Corporation. Cleaning system. 4,940,082, Cl. 15-321.000.
Rodney, Paul F.: *See*—
Bartel, Roger P.; and Rodney, Paul F., 4,940,943, Cl. 324-338.000.
Rodriguez, Damian: *See*—
Rodriguez, John; and Rodriguez, Damian, 4,940,188, Cl. 241-275.000.
Rodriguez, John; and Rodriguez, Damian. Tip holder for mineral breaker. 4,940,188, Cl. 241-275.000.
Rodriguez, Rodolfo R.: *See*—
Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., 4,940,668, Cl. 436-174.000.
Roeser, John O., to Otto Engineering, Inc. Roller bearing device and apparatus using same. 4,941,197, Cl. 384-44.000.
Rogers, John J.: *See*—
Porish, John A.; and Rogers, John J., 4,940,422, Cl. 439-356.000.
Rogers, Ronald S. Portable handheld circular saw. 4,939,843, Cl. 30-388.000.
Rogers, Stephen G.: *See*—
Shah, Dilip M.; Rogers, Stephen G.; Horsch, Robert B.; and Fraley, Robert T., 4,940,835, Cl. 800-205.000.
Rohe, Karl-Heinz; Sauerwein, Kurt; Weinlich, Karl; Link, Rainer; and Kinzer, Norbert, to Sauerwein, Kurt. Magnetic coupling. 4,940,452, Cl. 600-7.000.
Roinestad, Gerald C.; and Straight, Michael R., to Ashworth Bros., Inc. Conveyor belt and system with a non-collapsing inside edge. 4,940,133, Cl. 198-831.000.
Rokita, Stephen. Fastener holding tool. 4,939,959, Cl. 81-44.000.
Roller, George J.: *See*—
Holmes, Maurice F.; Roller, George J.; and Moore, Steven R., 4,941,023, Cl. 355-319.000.
Rolls-Royce plc: *See*—
Lilleker, Jonathan R.; Henshaw, Harry; and Winter, John L., 4,940,388, Cl. 416-97.00R.
Wood, Philip S.; and Fell, Peter J., 4,940,566, Cl. 420-443.000.
Romeo, Aurelio: *See*—
della Valle, Francesco; Romeo, Aurelio; and Lorenzi, Silvana, 4,940,694, Cl. 514-25.000.
Romer, Bendt W.; and Jorgensen, Kurt G., to Danfoss A/S. Connecting rod for an axial piston compressor. 4,939,952, Cl. 74-579.00E.
Rosen, Sanford: *See*—
Sibalis, Dan; and Rosen, Sanford, 4,940,456, Cl. 604-20.000.
Rosenberg, Leon: *See*—
De Wacker, Dennis R.; and Rosenberg, Leon, 4,940,741, Cl. 524-47.000.
Rosenbrand, Gerrit G.: *See*—
Bakkum, Jacobus A.; and Rosenbrand, Gerrit G., 4,940,776, Cl. 528-392.000.
Rosenstatter, Otto: *See*—
Apap, Marc F. C.; Thorin, Cedric L. M. C.; Rosenstatter, Otto; and Malata, Peter, 4,940,410, Cl. 433-102.000.
Ross, Richard R.: *See*—
Plee, Steven L.; Hartman, Peter; Martin, Jay K.; Nolan, J. Paul; Remboski, Donald J., Jr.; and Ross, Richard R., 4,940,033, Cl. 123-425.000.
Rosthauser, James W.; and Meckel, Walter, to Bayer Aktiengesellschaft; and Mobay Corporation. Continuous process for the production of powdered polyisocyanate addition products and the powders produced therefrom. 4,940,750, Cl. 524-871.000.
Roxas, Ren: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,939,887, Cl. 53-460.000.
Royal Institution for the Advancement of Learning, The: *See*—
Ooi, Boon Teck, 4,941,079, Cl. 363-132.000.
Rozanc, Richard A., to Ground Control, Inc. Mine roof support plate bolt. 4,940,365, Cl. 405-261.000.
Rubin, Bruce J.: *See*—
Baughman, Richard C.; Fowlkes, William Y.; Rubin, Bruce J.; and Vreeland, William B., 4,941,020, Cl. 355-275.000.
Rubin, Wallace, to Multicore Solders Limited. Flux composition. 4,940,498, Cl. 148-23.000.
Rudd, Milo; and Bakalar, Jerome. Duplex lens. 4,940,205, Cl. 249-63.000.
Ruebsmen, Klaus: *See*—
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.
Rup, Bonita J.; and Kahn, Larry E., to G. D. Searle & Co. Monoclonal antibodies against IgE-associated determinants, hybrid cell lines producing these antibodies, and use therefore. 4,940,782, Cl. 530-387.000.
Ruske, Manfred: *See*—
Bach, Volker; Sens, Ruediger; Etzbach, Karl-Heinz; and Ruske, Manfred, 4,940,692, Cl. 503-227.000.
Russ, Michael B.: *See*—
Peer, Roger L.; and Russ, Michael B., 4,940,532, Cl. 208-138.000.
Russell, James B. Miniature vehicle with magnetic enhancement of traction. 4,940,444, Cl. 446-446.000.
Rutfield, Sharon B., to GTE Products Corporation. Fluorescent lamp for liquid crystal backlighting. 4,940,918, Cl. 313-487.000.

Ryan Plastics Ireland Limited: *See—*
Fritsch, Joseph F., 4,941,065, Cl. 360-128.000.

Ryder, Francis E.; and Lisak, Stephen P., to Ryder International Corp.; and Textron Inc., a part interest. Gearbox drive system with plastic output gear. 4,939,945, Cl. 74-89.130.

Ryder International Corp.: *See—*
Ryder, Francis E.; and Lisak, Stephen P., 4,939,945, Cl. 74-89.130.

Rysewyk, Ambrose L., to American Telephone and Telegraph Company. Mobile hoist. 4,940,381, Cl. 414-619.000.

Rytand, David H. Floating dock. 4,940,021, Cl. 114-267.000.

Rzedzian, Richard R., to Advanced NMR Systems, Inc. Method of high-speed magnetic resonance imaging. 4,940,941, Cl. 324-312.000.

S.E.G. Resistor AB: *See—*
Soderholm, Arne, 4,939,938, Cl. 73-862.380.

Saalbach, Kurt; and Bergelin, Kurt, to Alfred Teves GmbH. Tandem master cylinder with piston stops and central valves. 4,939,901, Cl. 60-562.000.

Saam, Thomas J., to Scientific Atlanta. Uplink power control mechanism for maintaining constant output power from satellite transponder. 4,941,199, Cl. 455-10.000.

Sabhlok, Jatinder P.; Horan, William J.; and Carlton, Donna K., to Kraft General Foods, Inc. Microwavable stuffing mix. 4,940,591, Cl. 426-94.000.

Sacchi, Fabrizio: *See—*
Zuffada, Maurizio; and Sacchi, Fabrizio, 4,941,204, Cl. 455-164.000.

Saeki, Kunio: *See—*
Sato, Yasuo; and Saeki, Kunio, 4,940,176, Cl. 225-96.500.

SAES Getters SpA: *See—*
Giorgi, Ettore, 4,940,300, Cl. 313-559.000.

Saijo, Hiromitsu; Hayashi, Masamichi; and Morikawa, Takeji, to Minolta Camera Kabushiki Kaisha. Developing device. 4,940,014, Cl. 118-658.000.

Saint Switch, Inc.: *See—*
Aurand, Kenneth; and Blair, James F. L., 4,940,864, Cl. 200-342.000.

Saisho, Atsushi. Injection material for cosmetic treatment. 4,940,697, Cl. 514-63.000.

Saito, Keishi: *See—*
Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, 4,940,642, Cl. 430-65.000.

Saito, Tsunehiro: *See—*
Sato, Yasuo; Saito, Tsunehiro; Kamioka, Toshihito; Yoskikawa, Yukio; and Yoshikawa, Masaaki, 4,940,479, Cl. 65-99.200.

Sakai, Jun; and Natsume, Takeshi, to Honda Giken Kogyo Kabushiki Kaisha. Method for preventing loosening of a bolt. 4,940,610, Cl. 427-355.000.

Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, to Brother Kogyo Kabushiki Kaisha. Recording system having a coating device for coating recording medium or photosensitive medium with developer material reacting with color precursor. 4,940,643, Cl. 430-108.000.

Sakai, Jun, to Brother Kogyo Kabushiki Kaisha. Developer sheet and process for producing same. 4,940,688, Cl. 503-200.000.

Sakai, Shin: *See—*
Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, 4,940,542, Cl. 210-321.800.

Sakamoto, Daishiro; Mouri, Takayuki; and Tamura, Hisao, to Ikeda Bussan Co., Ltd. Latch device for foldable backrest of automotive seat. 4,940,266, Cl. 292-227.000.

Sakamoto, Yoshiaki, to Kabushiki Kaisha Toshiba. Phase lock recovery apparatus for phase locked loop circuit. 4,940,951, Cl. 331-4.000.

Sakamura, Ken; Nakazawa, Takuichiro; Hasegawa, Atsushi; Kawasaki, Ikuya; and Iwasaki, Kazuhiko, to Sakamura, Ken; Hitachi, Ltd.; and Hitachi Microcomputer Engineering Ltd. Data processing system having apparatus for increasing the execution speed of bit field instructions. 4,941,085, Cl. 364-200.000.

Sakano, Masahiro: *See—*
Kano, Kouji; Ogawa, Sumitaka; Sano, Minoru; and Sakano, Masahiro, 4,940,421, Cl. 439-273.000.

Sakashita, Shigeo, to Casio Computer Co., Ltd. Electronic musical instrument with pitch alteration function. 4,939,975, Cl. 84-626.000.

Sakuma, Hajime; Sasaki, Toshiyuki; and Komatsu, Katsumi, to Olympus Optical Co., Ltd. Method of performing measurement of hematocrit value and separate sampling of blood component. 4,939,925, Cl. 73-61.400.

Sakurai, Tsutomu; Hara, Yoshifumi; and Dougakiuchi, Yasumasa, to Matsushita Electric Industrial Co., Ltd. Loop-type optical fiber transmission system having master and slave apparatus. 4,941,206, Cl. 455-607.000.

Sal, Lieng H. Cutting tool. 4,939,841, Cl. 30-317.000.

Salant Corporation: *See—*
Aronson, Herbert R., 4,939,794, Cl. 2-128.000.

Salemme, Victor G.: *See—*
Ealey, Mark A.; and Salemme, Victor G., 4,940,318, Cl. 350-611.000.

Salerno, Catherine E., to McNeil-PPC, Inc. Sanitary napkin with expandable flaps. 4,940,462, Cl. 604-387.000.

Saletta, Gary F.: *See—*
Elms, Robert T.; Peterson, Clyde O.; and Saletta, Gary F., 4,940,391, Cl. 417-12.000.

Sallai, Katalin. Method and apparatus for enhancing a holographic image by candlelight. 4,940,301, Cl. 350-3.600.

Salomon S.A.: *See—*
Brischoux, Jean-Claude, 4,940,253, Cl. 280-629.000.

SamSung Electronics Co., Ltd.: *See—*
Kee, Heu-Tae, 4,940,406, Cl. 431-22.000.
Paik, Sanghoon; and Hong, Seokwon, 4,940,868, Cl. 219-10.55E.

Sanden Corporation: *See—*
Miyazawa, Kiyoshi; and Shimizu, Shigemi, 4,940,342, Cl. 384-510.000.
Shimizu, Shigemi; Kikuchi, Kazuto; and Terauchi, Kiyoshi, 4,940,396, Cl. 417-410.000.
Taguchi, Yukihiko, 4,940,393, Cl. 417-222.000.
Yamamoto, Tamaki; and Mabe, Atsushi, 4,940,395, Cl. 417-310.000.

Sander, Wendell B.: *See—*
Twitty, William B.; and Sander, Wendell B., 4,941,143, Cl. 370-85.200.

Sanders Associates, Inc.: *See—*
Upton, Ralph G., 4,941,202, Cl. 367-165.000.

Sanders, Harold F.: *See—*
Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., 4,940,586, Cl. 424-464.000.

Sandt, Jean. Mop head container. 4,940,139, Cl. 206-362.200.

Sangekar, Surendra; and Vadino, Winston A., to Schering Corporation. Sustained release labetalol tablets. 4,940,580, Cl. 424-80.000.

Sanidad, Armisticio Z.: *See—*
Daly, Robert E.; Sloan, Clifford E.; and Sanidad, Armisticio Z., 4,941,131, Cl. 366-167.000.

Sano, Hiroyuki: *See—*
Yokoyama, Hitoshi; Sano, Hiroyuki; Horimoto, Akiko; and Kizaki, Masatoshi, 4,940,600, Cl. 426-582.000.

Sano, Minoru: *See—*
Kano, Kouji; Ogawa, Sumitaka; Sano, Minoru; and Sakano, Masahiro, 4,940,421, Cl. 439-273.000.

Sano, Yoshinori: *See—*
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

SANOFI, Societe Anonyme: *See—*
Eyssautier, Bruno, 4,940,663, Cl. 435-104.000.

Sanshin Kogyo Kabushiki Kaisha: *See—*
Fujimoto, Hiroaki, 4,940,032, Cl. 123-424.000.

Santangelo, Francesco: *See—*
Bertolini, Giorgio; Casagrande, Cesare; and Santangelo, Francesco, 4,940,800, Cl. 548-327.000.

Santangelo, Joseph G.: *See—*
Kuphal, Jeffrey A.; Robeson, Lloyd M.; and Santangelo, Joseph G., 4,940,733, Cl. 521-79.000.

Santilli, Albert N.; and Kuzmick, Kenneth M. Tibia retractor. 4,940,066, Cl. 128-882.000.

Santilli, Vincent J., to Westinghouse Electric Corp. Vacuum interrupter with improved vapor shield for gas adsorption. 4,940,862, Cl. 200-144.00B.

Santina, Peter F.: *See—*
Olsen, Orrie C.; and Santina, Peter F., 4,940,549, Cl. 210-695.000.

Santina Water Company: *See—*
Olsen, Orrie C.; and Santina, Peter F., 4,940,549, Cl. 210-695.000.

Sanyo Electric Co., Ltd.: *See—*
Tsuchiyama, Yuji; and Hosoya, Masakazu, 4,939,909, Cl. 62-158.000.
Yasumoto, Masami; Motoike, Tatsuya; and Sawasa, Toshiyuki, 4,941,072, Cl. 362-249.000.

Sargent, Ralph R.: *See—*
Moss, Thomas H., III; Sargent, Ralph R.; and Williams, Michael S., 4,940,757, Cl. 525-502.000.

Sarges, Reinhard, to Pfizer Inc. 4-arylsulfonyl-3,4-dihydro-2(1H)-quinoxalinone-1-alkanoic acids, esters, and salts. 4,940,708, Cl. 514-249.000.

Sarkki, Juha: *See—*
Hiltunen, Matti; Lundqvist, Ragnar; and Sarkki, Juha, 4,940,007, Cl. 110-347.000.

Sarokin, Jerry L. Front mounted vehicle braking indicator. 4,940,962, Cl. 340-479.000.

Sasaki, Isao: *See—*
Anzai, Hisao; Nishida, Kozi; Sasaki, Isao; Makino, Hideaki; and Ohtani, Masami, 4,940,778, Cl. 528-481.000.

Sasaki, Mitsuru: *See—*
Itoh, Yoshikazu; Hatakoshi, Makoto; and Sasaki, Mitsuru, 4,940,699, Cl. 514-114.000.

Sasaki, Nobukazu: *See—*
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Sasaki, Shuji: *See—*
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Sasaki, Takashi; and Udagawa, Yoshiro, to Canon Kabushiki Kaisha. Color image processing method and apparatus in which a gradation-converted luminance signal and two non-linearly quantized color-difference signals having fewer bits than the luminance signal are used to address a color masking ROM. 4,941,037, Cl. 358-80.000.

Sasaki, Toshio; Ebara, Takeshi; and Kawai, Kiyoshi, to Sumitomo Chemical Company, Limited. Solid catalyst component for olefin polymerization. 4,940,682, Cl. 502-113.000.

Sasaki, Toshiyuki: *See—*
Sakuma, Hajime; Sasaki, Toshiyuki; and Komatsu, Katsumi, 4,939,925, Cl. 73-61.400.

Sasatani, Takashi: *See*—
Takada, Susumu; Fujishita, Toshio; Sasatani, Takashi; Matsushita, Akira; and Eigyo, Masami, 4,940,714, Cl. 514-293.000.

Sasib S.p.A.: *See*—
Vincenzini, Franco, 4,939,886, Cl. 53-236.000.

Satake Engineering Co., Ltd.: *See*—
Satake, Toshihiko, 4,940,850, Cl. 209-580.000.

Satake, Toshihiko, to Satake Engineering Co., Ltd. Color sorting apparatus. 4,940,850, Cl. 209-580.000.

Sato, Katsumi: *See*—
Matsumoto, Hideo; Sato, Katsumi; and Hokuyo, Shigeru, 4,940,496, Cl. 136-256.000.

Sato, Kiyoomi; Ushijima, Fumihiro; and Murata, Kiyohito, to Toyota Jidosha Kabushiki Kaisha. Drive mechanism in part-time four-wheel drive vehicle. 4,940,125, Cl. 192-85.0AA.

Sato, Koichi: *See*—
Shigyo, Naoyuki; and Sato, Koichi, 4,941,114, Cl. 364-578.000.

Sato, Makoto, to Honda Giken Kogyo Kabushiki Kaisha. Method and apparatus for controlling hydraulic braking pressure for a vehicle. 4,940,291, Cl. 303-15.000.

Sato, Muneyoshi: *See*—
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.

Sato, Shunji; and Honjo, Takeshi, to Canon Kabushiki Kaisha. Sheet handling apparatus. 4,940,225, Cl. 271-296.000.

Sato, Takayo: *See*—
Kurahashi, Yoshio; Goto, Toshio; Isono, Kunihiro; Kitagawa, Yoshinori; Izumi, Tetsuji; Kondo, Toshihito; and Sato, Takayo, 4,940,483, Cl. 71-94.000.

Sato, Toshifumi: *See*—
Ide, Motoki; and Sato, Toshifumi, 4,940,975, Cl. 340-825.440.

Sato, Toyoshi, to Kabushiki Kaisha Toshiba. Image-processing system with character reader and an image-processing method. 4,941,184, Cl. 382-17.000.

Sato, Yasuo; and Saeki, Kunio. Apparatus for cutting workpieces of glass, ceramics, and like material. 4,940,176, Cl. 225-96.500.

Sato, Yasuo; Saito, Tsunehiro; Kamioka, Toshihito; Yoshikawa, Yukio; and Yoshikawa, Masaaki, to Asahi Glass Company, Ltd. Method for manufacturing float glass. 4,940,479, Cl. 65-99.200.

Sato, Yoshimitsu, to Fuji Photo Film Co., Ltd. Image recording apparatus. 4,940,993, Cl. 346-76.0PH.

Satoh, Hiroaki. Tremolo device for a guitar. 4,939,971, Cl. 84-313.000.

Satta, Yusuke; and Takiura, Yasuro, to Yokogawa Medical Systems, Ltd. Image reconstruction data processing unit. 4,941,094, Cl. 364-413.210.

Satuka, Yoshihiko; and Kusuhara, Teturo, to Delta Kogyo Co., Ltd. Apparatus for assembling a seat for use in an automobile. 4,939,832, Cl. 29-281.400.

Sauer, Wolfgang: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Sauerwein, Kurt: *See*—
Rohe, Karl-Heinz; Sauerwein, Kurt; Weinlich, Karl; Link, Rainer; and Kinzer, Norbert, 4,940,452, Cl. 600-7.000.

Saunders, John: *See*—
Baker, Raymond; Kneen, Clare O.; Saunders, John; and Swain, Christopher, 4,940,703, Cl. 514-210.000.

Sauvion, Guy-Noel; Caillod, Jack; and Gourlaouen, Claire, to Rhone-Poulenc Specialites Chimique. Ceric oxide particulates having a stable specific surface and a process for their preparation. 4,940,685, Cl. 502-263.000.

Savaria, Normand M.: *See*—
Rhodes, Wayne T., III; and Savaria, Normand M., 4,940,626, Cl. 428-198.000.

Sawada, Hiroshi: *See*—
Kawai, Masumi; and Sawada, Hiroshi, 4,941,169, Cl. 378-99.000.

Sawada, Shigeru: *See*—
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,941,002, Cl. 346-160.000.

Sawasa, Toshiyuki: *See*—
Yasumoto, Masami; Motoike, Tatsuya; and Sawasa, Toshiyuki, 4,941,072, Cl. 362-249.000.

Sawyer, Mark W.: *See*—
Sawyer, W. David; and Sawyer, Mark W., 4,940,200, Cl. 248-97.000.

Sawyer, W. David; and Sawyer, Mark W., to Wilmarc, Inc. Support for a non-self supporting container. 4,940,200, Cl. 248-97.000.

Sayama, Masayuki, to Viscodrive Japan Ltd. Viscous coupling. 4,940,123, Cl. 192-58.00B.

Schaab, Carl K.: *See*—
Tararuj, Christopher; and Schaab, Carl K., 4,940,584, Cl. 424-401.000.

Schaal, Diana L.: *See*—
Schaal, Gary A.; and Schaal, Diana L., 4,939,801, Cl. 5-61.000.

Schaal, Gary A.; and Schaal, Diana L. Patient transporting and turning gurney. 4,939,801, Cl. 5-61.000.

Schachameyer, Steven R.; and Beranek, Mark W., to Eaton Corporation. Method for growing single crystalline silicon with intermediate bonding agent and combined thermal and photolytic activation. 4,940,505, Cl. 156-612.000.

Scheffner, Wolfgang: *See*—
Heidotting, Werner; Scheffner, Wolfgang; and Duerkop, Willi, 4,940,428, Cl. 439-598.000.

Scheimann, David W.: *See*—
Huang, Shu-Jen; and Scheimann, David W., 4,940,491, Cl. 134-38.000.

Scheiper, Hans-Juergen: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.

Schenkel, Thomas; and Staehli, Urs, to Rieter Machine Works, Ltd. Control apparatus for controlling flock height in a feed chute for a fiber processing machine. 4,939,816, Cl. 19-105.000.

Schering Aktiengesellschaft: *See*—
Grapentin, Hans-Joachim; Seidenspinner, Hubert-Matthias; and Tessmann, Detlef, 4,940,554, Cl. 252-357.000.

Schering Corporation: *See*—
Sangekar, Surendra; and Vadino, Winston A., 4,940,580, Cl. 424-80.000.

Scherr, Rudolf: *See*—
Ritter, Gerhard; Ritter, Klaus; Scherr, Rudolf; and Jursche, Kurt, 4,940,874, Cl. 219-87.000.

Schilperoort, Robbert A.; Hoekema, Andreas; and Hooykaas, Paul J. J. Process for the incorporation of foreign dna into the genome of dicotyledonous plants. 4,940,838, Cl. 800-205.000.

Schirmer, Henry G.: *See*—
Mueller, Walter B.; and Schirmer, Henry G., 4,940,634, Cl. 428-349.000.

Schlak, Ottfried: *See*—
Grape, Wolfgang; Schlak, Ottfried; de Montigny, Armand; and Kober, Hermann, 4,940,743, Cl. 524-377.000.

Schleinz, Robert J.: *See*—
Van Gompel, Paul T.; Suprise, Jody D.; and Schleinz, Robert J., 4,940,464, Cl. 604-396.000.

Schlemmer, Lothar: *See*—
Weber, Heinz; Bleckmann, Gerhard; Dembek, Gerhard; Ehrmann, Gerd; Heinz, Gerhard; and Schlemmer, Lothar, 4,940,629, Cl. 428-213.000.

Schleyerbach, Rudolf: *See*—
Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., 4,940,790, Cl. 544-8.000.

Schlichting, Karl: *See*—
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.

Schlumberger Technology Corporation: *See*—
Goldschild, Pierre, 4,940,088, Cl. 166-109.000.

Schmatelka, Bernhard: *See*—
Riedmaier, Josef; Widemann, Friedrich; and Schmatelka, Bernhard, 4,940,041, Cl. 126-110.00R.

Schmidt, Bodo; and Krause, Helmut, to Alfred Teves GmbH. Disc brake, especially for use with automotive vehicles. 4,940,120, Cl. 188-73.360.

Schmidt, Ewald: *See*—
Waitl, Guenther; Birkmann, Rolf; and Schmidt, Ewald, 4,940,855, Cl. 174-52.500.

Schmidt, Richard A.: *See*—
Tanagho, Emil A.; Schmidt, Richard A.; Gleason, Curtis A.; and Lue, Tom F., 4,940,065, Cl. 128-784.000.

Schmolke, Karl-Heinz, to Hollingsworth GmbH. Opening cylinder unit for open-end spinning machines. 4,939,897, Cl. 57-301.000.

Schneider, Hans-Dieter: *See*—
Topfl, Werner; Meyer, Willy; and Schneider, Hans-Dieter, 4,940,792, Cl. 544-321.000.

Schneider, Wolfgang: *See*—
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, 4,939,899, Cl. 60-412.000.

Schnoes, Heinrich K.: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lau, Wan F., 4,940,700, Cl. 514-167.000.

Schoch, Daniel A., to Minster Machine Company, The. Monitorable and compensatable feedback tool and control system for a press. 4,939,918, Cl. 72-20.000.

Schoenleber, Donald W.: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.

Scholtes: *See*—
Scholtes, Pierre; and Hoffmann, Michel, 4,940,869, Cl. 219-10.55F.

Scholtes, Pierre; and Hoffmann, Michel, to Scholtes. Combination convection and microwave oven having improved microwave energy distribution. 4,940,869, Cl. 219-10.55F.

Schram, Cornelius J., to National Research Development Corporation. Ultrasonic field generating device. 4,941,135, Cl. 367-150.000.

Schreder, Felix: *See*—
Kircherer, Robert; and Schreder, Felix, 4,940,886, Cl. 219-457.000.

Schrem, Kurt: *See*—
Kratzert, Herbert; and Schrem, Kurt, 4,940,352, Cl. 402-13.000.

Schrenk, Hartmut, to Siemens Aktiengesellschaft. Integrated semiconductor circuit. 4,941,034, Cl. 357-71.000.

Schuda, Felix; and Roberts, Roy D., to ILC Technology, Inc. Integral reflector flashlamp. 4,940,922, Cl. 315-246.000.

Schuetz, Guenter; and Schwartz, Joerg, to Leybold Aktiengesellschaft. Oil-metering cover for shaft bearings. 4,940,341, Cl. 384-465.000.

Schuhbauer, Alfred, to Alfred Kunz GmbH & Co. Process for sealing structural bodies or cavity-defining walls which may be subject to cracking. 4,939,878, Cl. 52-169.140.

Schuller, Matthias: *See*—
Boshagen, Horst; Junge, Bodo; Paessens, Arnold; and Schuller, Matthias, 4,940,705, Cl. 514-227.800.

Schuller, Paul D.; Hatcher, David C.; Caelli, Terrance M.; Eggert, Frank M.; and Yuzyk, Jerome, to University of Alberta, The Governors of the. Method and apparatus for improving the alignment of radiographic images. 4,941,164, Cl. 378-205.000.

Schultz, Ludwig; and Wecker, Joachim, to Siemens Aktiengesellschaft. Method for preparing superconducting oxide films by seeding formation and heat treatment. 4,940,842, Cl. 508-1.000.

Schulz, Guenther: *See*—
Kurtz, Karl-Rudolf; Koch, Horst; and Schulz, Guenther, 4,940,650, Cl. 430-283.000.

Schulz, Paul; Virnig, Michael J.; and Carduck, Franz J., to Henkel Kommanditgesellschaft auf Aktien. Process for ozonization of unsaturated organic compounds. 4,940,808, Cl. 549-436.000.

Schumacher, Josef: *See*—
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, 4,939,899, Cl. 60-412.000.

Schumacher, Percy W.: *See*—
Deane, John D.; Ivie, Craig R.; and Schumacher, Percy W., 4,940,099, Cl. 175-374.000.

Schummer, Dietmar: *See*—
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.

Schwab, John H.: *See*—
Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., 4,940,723, Cl. 514-396.000.

Schwartz, Joerg: *See*—
Schuetz, Guenter; and Schwartz, Joerg, 4,940,341, Cl. 384-465.000.

Schween, Heiner: *See*—
Horvath, Laszlo; Martin, Georges; and Schween, Heiner, 4,940,000, Cl. 104-295.000.

Schwenk, Walther: *See*—
List, Heinz, deceased; Schwenk, Walther; and Kunz, Alfred, 4,941,130, Cl. 366-99.000.

Schwertfeger, Werner, to Hoechst Aktiengesellschaft. Reaction of hexafluoropropene oxide with fluorinated carboxylic acid fluorides. 4,940,814, Cl. 562-849.000.

Schwirian, Richard E.; and Perone, Vincent A., to Westinghouse Electric Corp. Low neutron fluence nuclear reactor internals. 4,941,159, Cl. 376-458.000.

Scientific Atlanta: *See*—
Saam, Thomas J., 4,941,199, Cl. 455-10.000.

Scientific-Atlanta, Inc.: *See*—
Birch, Christopher H., 4,941,045, Cl. 358-140.000.

Scientific Generics Limited: *See*—
Pettigrew, Robert M.; Chambers, Stephen H.; Davies, Dafydd G.; and Crossfield, Michael D., 4,940,966, Cl. 340-551.000.

Scott, Douglas R.; Goddard, Peggy L.; and Wagner, Joseph P., to Robertshaw Controls Company. Oscillating crystal force transducer and method of making. 4,940,915, Cl. 310-338.000.

Scottow, Colin A.: *See*—
Spooner, Peter D.; and Scottow, Colin A., 4,939,936, Cl. 73-862.070.

Scungio, Roger V.; and Betters, Melodie A. Ornamental watch accessory. 4,939,913, Cl. 63-21.000.

Sebag, Henri; and Vanlerberghe, Guy, to L'Oreal. Cationic surface-active compounds. 4,940,573, Cl. 424-45.000.

Sebag, Henri: *See*—
Zyman, Alexandre; and Sebag, Henri, 4,940,575, Cl. 424-59.000.

Seegmiller, Brian: *See*—
Dinkha, Brian I.; Jasa, Paul B.; Seegmiller, Brian; and Simmons, Alden C., 4,939,996, Cl. 102-501.000.

Seele, Rainer; Karbach, Stefan; Janssen, Bernd; Kober, Reiner; Ammermann, Eberhard; and Lorenz, Gisela, to BASF Aktiengesellschaft. Fungicidal imidazolylmethyloxiranes. 4,940,717, Cl. 514-341.000.

Seethaler, Toni: *See*—
Kilthau, Gerhard; Spies, Karl H.; Vogt, Rolf; Freilaender, Peter; and Seethaler, Toni, 4,940,248, Cl. 277-80.000.

Sega Enterprises, Ltd.: *See*—
Ishida, Nobuaki; Ishimura, Yoshifumi; and Murayama, Hiroshi, 4,940,234, Cl. 273-1.0GA.

Seib, Bill G., to Grumman Aerospace Corporation. Removable container caster assembly with tow capability. 4,940,252, Cl. 280-418.100.

Seiden, Paul: *See*—
Orphanos, Peter D.; Bernhardt, Christian A.; Madison, Bryan L.; Seiden, Paul; Ehrman, Albert M.; Baginski, John R.; and Guffey, Timothy B., 4,940,601, Cl. 426-601.000.

Seidenspinner, Hubert-Matthias: *See*—
Grapentin, Hans-Joachim; Seidenspinner, Hubert-Matthias; and Tessmann, Detlef, 4,940,554, Cl. 252-357.000.

Seiko Epson Corporation: *See*—
Maruyama, Mitsuaki; Niki, Hiroshi; Sawada, Shigeru; Mochizuki, Seiji; and Gyoutoku, Yasuhiro, 4,941,002, Cl. 346-160.000.

Seikosha Co., Ltd.: *See*—
Kikuchi, Koji, 4,941,137, Cl. 368-223.000.

Seiler, Erhard: *See*—
Lausberg, Dietrich; Ittemann, Peter; McKee, Graham E.; Schlichting, Karl; Knoll, Manfred; and Seiler, Erhard, 4,940,745, Cl. 524-504.000.
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.

Seitz, Friedrich: *See*—
Aldag, Reinhard; Neumann, Peter; Boettcher, Andreas; Bluemel, Thomas; Seitz, Friedrich; and Raulfs, Friedrich-Wilhelm, 4,940,649, Cl. 430-281.000.

Seitz, Michael E. A., to Standard Register Company, The. High solids CB printing ink containing a protective colloid blend. 4,940,738, Cl. 523-161.000.

Seitz, Michael E. A., to Standard Register Company, The. Process for making a high solids CB printing ink. 4,940,739, Cl. 523-161.000.

Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, to BASF Aktiengesellschaft. Basically substituted phenylacetonitriles, their preparation and drugs containing these compounds. 4,940,780, Cl. 558-388.000.

Seki, Tetsuya: *See*—
Taniguchi, Takashi; and Seki, Tetsuya, 4,940,602, Cl. 427-40.000.

Selby, John L. Open line source speaker system. 4,940,108, Cl. 181-145.000.

Selkirk, Alastair B.: *See*—
MacFarlane, Calum B.; Selkirk, Alastair B.; and Dey, Michael J., 4,940,556, Cl. 264-15.000.

Sell, Gustav: *See*—
Formsmann, Bernd; Hepp, Wolfgang; Heine, Gerold; Sell, Gustav; and Zech, Hendrik, 4,940,050, Cl. 128-24.00A.

Semco Laboratories, Inc.: *See*—
Weber, Myer M., 4,940,539, Cl. 210-149.000.

Semiconductor Energy Laboratory Co., Ltd.: *See*—
Hamatani, Toshiji, 4,940,313, Cl. 350-342.000.

Sens, Ruediger: *See*—
Bach, Volker; Sens, Ruediger; Etzbach, Karl-Heinz; and Ruske, Manfred, 4,940,692, Cl. 503-227.000.

SensorTech, L. P.: *See*—
Klauber, Robert D.; and Vigmostad, Erik B., 4,939,937, Cl. 73-862.360.

Seydl, Wolfgang: *See*—
Lausberg, Dietrich; Seydl, Wolfgang; Knoll, Manfred; Seiler, Erhard; Gutsche, Herbert; and Kolm, Peter, 4,940,746, Cl. 524-504.000.

Sfarti, Adrian, to Advanced Micro Devices, Inc. Video picking and clipping method and apparatus. 4,941,111, Cl. 364-521.000.

SGI Inc.: *See*—
Jacober, Jeffrey M., 4,940,173, Cl. 224-151.000.

SGS-Thomson Microelectronics s.r.l.: *See*—
Zuffada, Maurizio; and Sacchi, Fabrizio, 4,941,204, Cl. 455-164.000.

Shaak, Ray N.: *See*—
Redmond, John P.; and Shaak, Ray N., 4,940,426, Cl. 439-495.000.

Shachibata Industrial Co., Ltd.: *See*—
Inaguma, Shoichi; Hasegawa, Masayuki; and Ichihashi, Akira, 4,939,990, Cl. 101-109.000.

Shadwell, David W.; and Joseph, Martin, to Imperial Chemical Industries PLC. Connector. 4,940,168, Cl. 222-153.000.

Shaffer, Joseph W.: *See*—
Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., 4,940,411, Cl. 433-215.000.

Shaffer, Stephen J.; Warren, Richard A.; Eggers, Thomas W.; and Strecker, William D., to Digital Equipment Corporation. Split bus multiprocessing system with data transfer between main memory and caches using interleaving of sub-operations on sub-busses. 4,941,088, Cl. 364-200.000.

Shah, Dilip M.; Rogers, Stephen G.; Horsch, Robert B.; and Fraley, Robert T., to Monsanto Company. Glyphosate-resistant plants. 4,940,835, Cl. 800-205.000.

Shamouilian, Shamouil; and Ludwig, Paul N., to Digital Equipment Corporation. Apparatus and method for forming die sites in a high density electrical interconnecting structure. 4,940,508, Cl. 156-643.000.

Shape Inc.: *See*—
Swinburne, Stephen G.; Gelardi, Anthony L.; and Stiles, William, 4,941,066, Cl. 360-133.000.

Shapiro, Steven C.: *See*—
Gutman, Jose; and Shapiro, Steven C., 4,940,963, Cl. 340-313.000.

Shappirio, Joel R.; Aucoin, Thomas R.; and Finnegan, John J., to United States of America, Army. High temperature superconducting thin film structure and method of making. 4,940,693, Cl. 505-1.000.

Sharp, Bruce R. Method of retrofitting a primary pipeline system with a semi-rigid pipeline. 4,939,923, Cl. 73-40.50R.

Sharp Kabushiki Kaisha: *See*—
Ataka, Yasukazu, 4,939,810, Cl. 15-347.000.
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,941,024, Cl. 357-4.000.
Ogura, Mitsuru, 4,941,014, Cl. 355-27.000.
Tanaka, Hideaki; Morita, Toshiaki; and Konya, Minehiro, 4,941,195, Cl. 382-61.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Kudo, Hiroaki, 4,941,148, Cl. 372-96.000.

Sheahan, Thomas J., to Digital Appliance Controls, Inc. Frequency multiplier circuitry and method. 4,941,160, Cl. 377-28.000.

Sheets, Ronald E., to Tamarack Scientific Co., Inc. Method and apparatus for effecting selective ablation of a coating from a substrate, and controlling the wall angle of coating edge portions. 4,940,881, Cl. 219-121.690.

Shell Oil Company: *See*—
Bakkum, Jacobus A.; and Rosenbrand, Gerrit G., 4,940,776, Cl. 528-392.000.
Broekhuis, Antonius A.; Luijk, Pieter; and Stamhuis, Jan E., 4,940,756, Cl. 525-237.000.

Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., 4,940,809, Cl. 549-559.000.
Drent, Eit, 4,940,775, Cl. 528-392.000.
Drent, Eit, 4,940,777, Cl. 528-392.000.
Drent, Eit, 4,940,787, Cl. 536-124.000.
Janssen, Frank J.; Wilms, Coenraad H.; Reinalda, Donald; and Bruijn, Hendrik W., 4,940,827, Cl. 585-646.000.
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.
Wang, Pen C., 4,940,801, Cl. 548-410.000.
Wong, Pui K., 4,940,758, Cl. 525-539.000.
Wong, Pui K., 4,940,774, Cl. 528-392.000.

Sheng-Jung, Wu. Automatic mail handling and postage vending machine. 4,940,887, Cl. 235-381.000.

Shepherd, Mark R.: *See*—
Paton, Anthony D.; Temple, Stephen; and Shepherd, Mark R., 4,940,996, Cl. 346-140.00R.

Sheriff, Jack W. Discontinuous mobile antenna. 4,940,991, Cl. 343-795.000.

Shiau, Shoei-Shuh. Waterproof switching device. 4,940,860, Cl. 200-60.000.

Shibata, Istuo; and Fukahori, Osamu, to JU-OH, Inc. Induction heating apparatus for injection molding machine. 4,940,870, Cl. 219-10.491.

Shibata, Makoto: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,940,999, Cl. 346-140.00R.

Shieh, Jin-Ren. Bracing medium for case or the like. 4,940,267, Cl. 292-263.000.

Shigyo, Naoyuki; and Sato, Koichi, to Kabushiki Kaisha Toshiba. Triangular mesh generation method. 4,941,114, Cl. 364-578.000.

Shikibo Ltd.: *See*—
Fujimura, Shoji; and Kawai, Toru, 4,939,844, Cl. 33-12.000.

Shim-A-Line, Inc.: *See*—
Specktor, Gerald A., 4,940,373, Cl. 411-87.000.

Shimadzu Corporation: *See*—
Kawai, Masumi; and Sawada, Hiroshi, 4,941,169, Cl. 378-99.000.

Shimazaki, Noribiko; Hemmi, Keiji; Nakaguti, Osamu; Miyazaki, Yoshio; and Hashimoto, Masashi, to Fujisawa Pharmaceutical Co., Ltd. Piperazine compound as PAF-antagonist. 4,940,709, Cl. 514-253.000.

Shimizu, Makoto; and Konishi, Hiroshi, to OKI Electric Industry Co., Ltd. Card read/write device. 4,940,418, Cl. 439-260.000.

Shimizu, Makoto: *See*—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.

Shimizu, Shigemi; Kikuchi, Kazuto; and Terauchi, Kiyoshi, to Sanden Corporation. Hermatic scroll type compressor with two casings and center blocks. 4,940,396, Cl. 417-410.000.

Shimizu, Shigemi: *See*—
Miyazawa, Kiyoshi; and Shimizu, Shigemi, 4,940,342, Cl. 384-510.000.

Shimp, David A., to Hi-Tek Polymers, Inc. Stable solutions of prepolymers of thiods(phenylcyanate) and laminating method employing same. 4,940,848, Cl. 156-307.400.

Shimura, Kazuo, to Fuji Photo Film Co., Ltd. Method of compressing radiation image signal. 4,941,194, Cl. 382-56.000.

Shin, Yuaki: *See*—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 4,940,618, Cl. 428-64.000.

Shinkai, Ichiro: *See*—
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,520, Cl. 204-157.710.
Mills, Sander G.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,803, Cl. 549-302.000.

Shinogi, Kouzi: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satoeni; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.

Shionogi & Co., Ltd.: *See*—
Takada, Susumu; Fujishita, Toshio; Sasatani, Takashi; Matsushita, Akira; and Eigyo, Masami, 4,940,714, Cl. 514-293.000.

Shirai, Shigeru; Saito, Keishi; Arai, Takayoshi; Kato, Minoru; and Fujioka, Yasushi, to Canon Kabushiki Kaisha. Electrophotographic light receiving member having polycrystalline silicon charge injection inhibition layer prepared by chemical reaction of excited precursors and A-SI:C:H surface layer. 4,940,642, Cl. 430-65.000.

Shiroki Corporation: *See*—
Nagasaka, Youetsu, 4,940,284, Cl. 297-284.000.

Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, fumikazu; and Ohguchi, Masakatsu, to Toyo Boseki Kabushiki Kaisha. Process for preparing antistatic fiber. 4,940,560, Cl. 264-211.000.

Shoher, Itzhak; and Whiteman, Aharon. Dental foil and crown. 4,940,637, Cl. 428-607.000.

Shoji, Toru: *See*—
Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.

Short, Paul J.: *See*—
Hancock, William R.; Short, Paul J.; and Weingartner, Thomas A., 4,941,116, Cl. 364-718.000.

Shoup, Robert D.: *See*—
Bohlayer, Julie A.; Foster, Gordon F.; and Shoup, Robert D., 4,940,675, Cl. 501-12.000.

Shoup, Thomas A., to Hewlett-Packard Company. Ultrasonic transducer arrays and methods for the fabrication thereof. 4,939,826, Cl. 29-25.350.

Showa Denko K. K.: *See*—
Iijima, Hitoshi; and Nishimura, Kunio, 4,940,665, Cl. 435-187.000.

Shroot, Braham; Eustache, Jacques; and Bernardon, Jean-Michel, to Centre International de Recherches Dermatologioues (CIRD). Benzonaphthalene derivatives and their use in therapeutic and cosmetic compositions. 4,940,696, Cl. 514-62.000.

Shu, Paul; and Shu, Winston R., to Mobil Oil Corporation. Method for selectively plugging a zone having varying permeabilities with a temperature activated gel. 4,940,091, Cl. 166-270.000.

Shu, Paul: *See*—
Hoskin, Dennis H.; and Shu, Paul, 4,940,090, Cl. 166-270.000.

Shu, Winston R.: *See*—
Shu, Paul; and Shu, Winston R., 4,940,091, Cl. 166-270.000.

Shue, Ming-Jeng. High resolution stethoscopic apparatus. 4,940,023, Cl. 128-715.000.

Shuler, Michael L.: *See*—
Cho, Toohyon; and Shuler, Michael L., 4,940,547, Cl. 210-643.000.

Sibalis, Dan; and Rosen, Sanford. Electrolytic transdermal delivery of proteins. 4,940,456, Cl. 604-20.000.

Sieborger, Gunther H. K. O., to U.S. Philips Corporation. Full wave rectifier circuit. 4,941,080, Cl. 363-127.000.

Siecor Corporation: *See*—
Blew, Douglas J., 4,939,896, Cl. 57-293.000.

Siemens Aktiengesellschaft: *See*—
Buettner, Gerhard, 4,941,180, Cl. 381-69.200.
Hoyler, Gerhard; Grabmaier, Josef; Falckenberg, Richard; and Freienstein, Bernhard, 4,940,568, Cl. 422-245.000.
Jass, Wieland, 4,941,043, Cl. 358-133.000.
Schrenk, Hartmut, 4,941,034, Cl. 357-71.000.
Schultz, Ludwig; and Wecker, Joachim, 4,940,842, Cl. 508-1.000.
Waitl, Guenther; Birkmann, Rolf; and Schmidt, Ewald, 4,940,855, Cl. 174-52.500.

Siemens-Pacesetter, Inc.: *See*—
Mann, Brian M.; and Poore, John W., 4,940,052, Cl. 128-419.0PG.
Mann, Brian M.; and Poore, John W., 4,940,053, Cl. 128-419.0PG.

SIG Schweizerische Industrie-Gesellschaft: *See*—
Walz, Theo, 4,940,129, Cl. 198-418.600.

Sigmund, Sandra K.: *See*—
Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., 4,940,718, Cl. 514-370.000.

Signorini, Roberto: *See*—
Botre, Francesco; and Signorini, Roberto, 4,940,793, Cl. 544-349.000.

Silk, Vicki A.; and Gray, Regina. Highchair food collection. 4,940,620, Cl. 428-81.000.

Silverschotz, Stanford: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.

Silvestri, George J., Jr., to Westinghouse Electric Corp. System for admitting steam into a turbine. 4,940,383, Cl. 415-44.000.

Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, to Tomei Sangyo Kabushiki Kaisha; and Mitsubishi Rayon Co., Ltd. Liquid purifying device. 4,940,542, Cl. 210-321.800.

Simmons, Alden C.: *See*—
Dinkha, Brian I.; Jasa, Paul B.; Seegmiller, Brian; and Simmons, Alden C., 4,939,996, Cl. 102-501.000.

Simon, Gyorgy: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Simpson, Howard D.; and Borgens, Pauline B., to Union Oil Company of California. Hydroprocessing hydrocarbon oils. 4,940,533, Cl. 208-216.00R.

Simson, Dionizy: *See*—
Holderegger, Jurg; and Simson, Dionizy, 4,940,354, Cl. 403-5.000.

Sinay, Terry G., Jr.; and Sysko, Robert J., to Pfizer Inc. Process for the production of phthalazineacetic acid ester derivatives and a novel hydrazine containing intermediate. 4,940,791, Cl. 544-237.000.

Singh, Sheo B.: *See*—
Pettit, George R.; and Singh, Sheo B., 4,940,726, Cl. 514-450.000.

Sink, William H.: *See*—
Flotow, Richard A.; Sink, William H.; and Hermanns, Martin J., 4,940,126, Cl. 192-89.00B.

Sipos, Judit: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.

Siragusa, Angela. Hygienic swab-type device with extender handle cover. 4,940,454, Cl. 604-1.000.

Sistermann, Klaus: *See*—
Naber, Wilfried; Ungerer, Heinz-Jurgen; and Sistermann, Klaus, 4,940,478, Cl. 65-27.000.

Siu, Fredrick W. C.: *See*—
Kharadly, Mostafa Z.; and Siu, Fredrick W. C., 4,940,990, Cl. 343-773.000.

Skees, Hugh B., to Standard Register Company, The. Clean release laminate construction with latent image. 4,940,690, Cl. 503-206.000.

SKF GmbH: *See*—
Kober, Jurgen; and Brandenstein, Manfred, 4,940,448, Cl. 474-111.000.
SKF Industrial Trading and Development Co. B.V.: *See*—
Smalley, Robert J.; and Noordman, Maarten, 4,939,922, Cl. 73-10.000.
Skinner, James T., Jr. Text comparator with counter shift register. 4,941,124, Cl. 364-900.000.
Skudera, William J., Jr.: *See*—
Mariani, Elio A.; and Skudera, William J., Jr., 4,941,133, Cl. 367-140.000.
Slater, Robert W. Intercom apparatus for integrating disparate audio sources for use in light aircraft or similar high noise environments. 4,941,187, Cl. 381-86.000.
Sleigh, Neville J. H.: *See*—
Brown, Stephen A.; and Sleigh, Neville J. H., 4,940,363, Cl. 405-296.000.
Sloan, Alan D.: *See*—
Barnsley, Michael F.; and Sloan, Alan D., 4,941,193, Cl. 382-56.000.
Sloan, Clifford E.: *See*—
Daly, Robert E.; Sloan, Clifford E.; and Sanidad, Armisticio Z., 4,941,131, Cl. 366-167.000.
Small, J. Barry; and Buynoski, Matthew S., to National Semiconductor Corporation. High voltage complementary NPN/PNP process. 4,940,671, Cl. 437-31.000.
Smalley, Robert J.; and Noordman, Maarten, to SKF Industrial Trading and Development Co. B.V. Method and device for examining the wear and friction properties of surface materials exposed to sliding friction. 4,939,922, Cl. 73-10.000.
Smialek, Edward B. Ski grinding device. 4,939,873, Cl. 51-281.00R.
Smith, Edgar M., to Burle Technologies, Inc. Balanced digital infrared detector circuit. 4,940,967, Cl. 340-567.000.
Smith, Mark J., to Anetsberger Brothers, Inc. Humidity control system. 4,939,987, Cl. 99-468.000.
Smith, Robert L.: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.
Smith, Todd: *See*—
Cannalte, Gary A.; Smith, Todd; Zancho, William F.; and Crawford, Robert J., 4,941,167, Cl. 379-67.000.
Smith, W. Novis, Jr.; and Carroll, Michael G. Radiation absorption device. 4,940,619, Cl. 428-74.000.
Smithsonian Institution: *See*—
Boyne, Walter J., 4,941,125, Cl. 364-900.000.
Smrt, Thomas J., to Fox Valley Systems, Inc. Spraying apparatus with speed indicating assembly. 4,940,184, Cl. 239-71.000.
Snef Electro Mecanique: *See*—
Petit, Nicaise; and Moisset, Jean-Claude, 4,940,4:4, Cl. 134-1.000.
Snider, David E.: *See*—
Steele, David S.; Armstrong, Randolph K.; and Snider, David E., 4,940,944, Cl. 324-425.000.
Snyder Laboratories, Inc.: *See*—
Olson, Daniel H., 4,940,457, Cl. 604-30.000.
Societe Anonyme dite : Alsthom: *See*—
Thuries, Edmond; Pham, Van Doan; and Ledru, Roger, 4,940,961, Cl. 338-21.000.
Societe Anonyme dite: Etablissements Tasserit: *See*—
Akcelrod, Patrick, 4,940,218, Cl. 269-322.000.
Societe Anonyme dite:L'Oreal: *See*—
Zysman, Alexandre; and Sebag, Henri, 4,940,575, Cl. 424-59.000.
Societe Anonyme: Spontex: *See*—
Colin, Claudine; and Wertz, Jean-Luc, 4,940,631, Cl. 428-309.900.
Societe d'Applications Generales d'Electricite et de Mecanique: *See*—
Amand, Yvon, 4,939,935, Cl. 73-517.0AV.
Societe d'Applications Generales d'Electricite et de Mecanique (S A G E M): *See*—
Mouchot, Carine; and Frappier, Gerard, 4,940,972, Cl. 340-747.000.
Societe de Ventilation et d'Electricite Appliquees - Velecta: *See*—
Kant, Michel; Biedinger, Jean-Marie; Quessard, Roland; and Galko, Jacques, 4,940,912, Cl. 310-162.000.
Societe Nationale d'Etude et de Construction de Moteurs d'Aviation "S.N.E.C.M.A." : *See*—
Feuvrier, Thierry; and Forestier, Alexandre, 4,940,386, Cl. 415-209.200.
Lardellier, Alain M. J., 4,940,196, Cl. 244-54.000.
Soderholm, Arne, to S.E.G. Resistor AB. Load transmitting device for electromechanical measurement transducers. 4,939,938, Cl. 73-862.380.
Sojka, Marvin L., to Norand Corporation. Multiterminal communication system and method. 4,940,974, Cl. 340-825.080.
Sollenberger, Nelson R.: *See*—
Chuang, Justin C.; and Sollenberger, Nelson R., 4,941,155, Cl. 375-84.000.
Soltani, Peter K., to Quantex Corporation. Thin film inorganic scintillator and method of making same. 4,940,603, Cl. 427-66.000.
Solvi, Marc, to Paul Wurth S.A. Device for injecting preheated air into a shaft furnace. 4,940,005, Cl. 110-182.500.
Somers Vine, John R., to Dorbyl Light and General Engineering (Proprietary) Limited. Pipe couplings. 4,940,261, Cl. 285-112.000.
Sommer, Thomas: *See*—
Walzer, Winfried; and Sommer, Thomas, 4,939,954, Cl. 74-733.100.
Sommerville, Iain D.; and Kemeny, Francis L., to University of Toronto Innovations Foundation, The. Process for treating liquid metals. 4,940,486, Cl. 75-10.190.
Soni, Pravin, to Raychem Corporation. Device for forming a solder connection. 4,940,179, Cl. 228-56.300.
Sony Corporation: *See*—
Ito, Kengo, 4,940,689, Cl. 503-202.000.
Motoe, Hisafumi; Kawashima, Hiroyuki; and Tokuhara, Masaharu, 4,941,046, Cl. 358-167.000.
Sorensen, Ole V.: *See*—
Pedersen, Harry E.; and Sorensen, Ole V., 4,940,106, Cl. 180-139.000.
Sorrell, Perry A.: *See*—
Taylor, John W., Jr.; and Sorrell, Perry A., 4,940,985, Cl. 342-174.000.
Soubliere, Marc P., to Telepanel, Inc. Shelf tag moulding attachment assembly. 4,939,861, Cl. 40-651.000.
Southwire Company: *See*—
Starnes, Ralph E., Jr., 4,940,504, Cl. 156-500.000.
Spang, Peter: *See*—
Aumueller, Alexander; Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,940,742, Cl. 324-93.000.
Sparks, Randall T.; and Geoghegan, Edward J., to Elan Corporation. Controlled release powder and process for its preparation. 4,940,588, Cl. 424-490.000.
Spater, Stuart S.: *See*—
Kolton, Chester; and Spater, Stuart S., 4,940,146, Cl. 211-13.000.
Spatz, Mark W.; and Tandler, John J., to Gas Research Institute. Multistage boiler/regenerator for liquid desiccant dehumidifiers. 4,939,906, Cl. 62-94.000.
Specktor, Gerald A., to Shim-A-Line, Inc. Nut and bolt locking emchanism. 4,940,373, Cl. 411-87.000.
Spectra, Inc.: *See*—
Hine, Nathan P.; and Wells, Robert L., Jr., 4,940,995, Cl. 346-140.00R.
Speich, Jurg: *See*—
Aebi, Rudolf; Hubele, Adolf; and Speich, Jurg, 4,940,799, Cl. 548-268.800.
Speiser, Josef; and Fischer, Manfred, to Wankel GmbH. Lubrication system for a rotary-piston internal combustion engine. 4,940,400, Cl. 418-61.200.
Spendel, Wolfgang U., to Procter & Gamble Company, The. Process for preparing soft tissue paper treated with noncationic surfactant. 4,940,513, Cl. 162-112.000.
Spengler, William E., to Tolco Corporation. Modular storage rack. 4,940,150, Cl. 211-188.000.
Speranza, George P.; and Lin, Jiang-Jen, to Texaco Chemical Co. Novel compositions from polyoxyalkylene amines and epoxides. 4,940,770, Cl. 528-111.000.
Sperry, William: *See*—
Childers, Winthrop D.; and Sperry, William, 4,940,413, Cl. 439-67.000.
Spies, Karl H.: *See*—
Kilthau, Gerhard; Spies, Karl H.; Vogt, Rolf; Freilaender, Peter; and Seethaler, Toni, 4,940,248, Cl. 277-80.000.
Spinder, Pieter, to Spinder Stalinrichting B.V. Feeding gate. 4,940,022, Cl. 119-148.000.
Spinder Stalinrichting B.V.: *See*—
Spinder, Pieter, 4,940,022, Cl. 119-148.000.
Spinelli, Harry J.; and Cohen, Gordon M., to Du Pont de Nemours, E. I., and Company. Group transfer polymerization of glycidyl (meth)acrylate copolymers to form oxirane group-terminated block copolymers. 4,940,761, Cl. 526-273.000.
Spooner, Peter D.; and Scottow, Colin A., to Protos Precision Systems Limited. Shapemeter. 4,939,936, Cl. 73-862.070.
Square D Company: *See*—
Brown, Robert J., Jr.; and Erturk, Bahattin, 4,940,903, Cl. 307-122.000.
Buchanan, Jeffery J., 4,940,355, Cl. 403-24.000.
Stabilus GmbH: *See*—
Hosan, Hans-Josef; and Knopp, Axel, 4,940,202, Cl. 248-162.100.
Stabler, Sally P.: *See*—
Allen, Robert H.; Stabler, Sally P.; and Lindenbaum, John, 4,940,658, Cl. 435-4.000.
Staege, Ruediger. Truck loading. 4,940,379, Cl. 414-401.000.
Staehli, Urs: *See*—
Schenkel, Thomas; and Staehli, Urs, 4,939,816, Cl. 19-105.000.
Staheli, Christoph; and Staehli, Urs, 4,940,367, Cl. 406-30.000.
Stagg, Jonathan B. Arrow attachment. 4,940,246, Cl. 273-421.000.
Stabeli, Christoph; and Staehli, Urs, to Rieter Machine Works, Ltd. Pneumatic flock feed system for supplying multiple cards and/or staple carting machines. 4,940,367, Cl. 406-30.000.
Stahl, Werner; and Barten, Axel, to Achenbach Buschhutten GmbH. Monitoring device for roll bearings in rolling mills. 4,939,920, Cl. 72-237.000.
Stamhuis, Jan E.: *See*—
Broekhuis, Antonius A.; Luijk, Pieter; and Stamhuis, Jan E., 4,940,756, Cl. 525-237.000.
Standard International, Inc.: *See*—
Williams, James H., 4,940,259, Cl. 285-3.000.
Standard Register Company, The: *See*—
Seitz, Michael E. A., 4,940,738, Cl. 523-161.000.
Seitz, Michael E. A., 4,940,739, Cl. 523-161.000.
Skees, Hugh B., 4,940,690, Cl. 503-206.000.
Stanfield, John. Flatware case. 4,940,143, Cl. 206-553.000.
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Weberndoerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, to BASF Aktiengesellschaft. Making paper, board and cardboard of high dry strength. 4,940,514, Cl. 162-168.200.

Starnes, Ralph E., Jr., to Southwire Company. Apparatus for extrusion. 4,940,504, Cl. 156-500.000.

Stasiak, Daniel L.: *See*—
Brown, Jeffrey D.; Freerksen, Donald L.; Hilker, Scott A.; and Stasiak, Daniel L., 4,941,120, Cl. 364-748.000.

State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, The: *See*—
Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, 4,941,162, Cl. 378-3.000.

Stay, Kevin E., to Modine Manufacturing Company. Tank for a heat exchanger. 4,940,086, Cl. 165-173.000.

Stc PLC: *See*—
Phillips, John A.; and Dunnett, Bruce, 4,940,983, Cl. 341-171.000.

Steck, Bernhard: *See*—
Nevill, David J.; and Steck, Bernhard, 4,940,720, Cl. 514-383.000.
Nevill, David J.; and Steck, Bernhard, 4,940,721, Cl. 514-383.000.

Steelcase, Inc.: *See*—
Knauf, Marvin C., 4,941,071, Cl. 362-133.000.

Steele, David S.; Armstrong, Randolph K.; and Snider, David E., to Westinghouse Electric Corp. Cathodic protection analyzer in which the fundamental and odd harmonics of a power line frequency are removed. 4,940,944, Cl. 324-425.000.

Steer, Peter L., to E. R. Squibb & Sons, Inc. Filter for attachment to an ostomy bag. 4,940,461, Cl. 604-333.000.

Steffens, Ralf: *See*—
Berges, Hanns-Peter; Kriehn, Hartmut; Leier, Wolfgang; and Steffens, Ralf, 4,940,398, Cl. 417-410.000.

Steffes, Thomas J., to Brunswick Corporation. Engine lifting method and tool. 4,940,271, Cl. 294-1.100.

Stein, Inc.: *See*—
Randall, James E.; Lemke, Ronald D.; and Mesteller, Robert A., 4,940,040, Cl. 126-21.00A.

Steinke, Gary L., to Kartridg Pak Co., The. Chub machine. 4,939,885, Cl. 53-138.00A.

Steinmetz, John H.: *See*—
Breault, Michelle S.; and Steinmetz, John H., 4,941,091, Cl. 364-406.000.

Stellram S.A.: *See*—
Aebi, Gilbert; Raye, Pierre; David, Maurice J. A.; and Marianneau, Michel E. A., 4,940,369, Cl. 407-42.000.

Stenderup, Ole: *See*—
Kyster, Erik; Jakobsen, Niels-Henrik G.; Molbaek, Jens J.; Stenderup, Ole; and Straede, Bjarne, 4,940,538, Cl. 210-137.000.

Stepan, Jiri E.: *See*—
Kubin, Peter Z.; and Stepan, Jiri E., 4,940,010, Cl. 110-233.000.

Stephens, Harold D.: *See*—
Whitcomb, Carl E.; and Stephens, Harold D., 4,939,865, Cl. 47-77.000.

Stern, Kenneth J.; and Beck, John A., to Crystal Semiconductor. Linear jitter attenuator. 4,941,156, Cl. 375-118.000.

Stewart, Thomas G., Jr.: *See*—
Dewhirst, Kenneth C.; and Stewart, Thomas G., Jr., 4,940,809, Cl. 549-559.000.

Stewart Warner Corporation: *See*—
Breitung, Edward J., II, 4,941,136, Cl. 368-8.000.

STFI: *See*—
Ostman, Leif T., 4,939,929, Cl. 73-159.000.

Stiffler, Stephen P.; and Beach, Wayne H., to Kennametal Inc. Earth engaging cutter bit. 4,940,288, Cl. 299-79.000.

Stil, Lambert J., to U.S. Philips Corporation. Color cathode ray tube having an in-line electron gun. 4,940,917, Cl. 313-414.000.

Stiles, William: *See*—
Swinburne, Stephen G.; Gelardi, Anthony L.; and Stiles, William, 4,941,066, Cl. 360-133.000.

Stingelin, Willy, to Ciba-Geigy Corporation. Disazo containing diaminostilbene as diazo component and an aniline coupling component bearing a cationic alkyl ammonium group. 4,940,783, Cl. 534-605.000.

Stittle, Kenneth W., to Noma Outdoor Products Inc. On the go gear shifter. 4,939,948, Cl. 74-473.00R.

Stober, Reinhard; Fischer, Wolfgang; Huss, Michael; and Pieter, Reimund, to Degussa Aktiengesellschaft. Method for the dry cationization of galactomannans (II). 4,940,784, Cl. 536-1.100.

Stober, Reinhard; Bischoff, Dietmar; and Huss, Michael, to Degussa Aktiengesellschaft. Method of preparing cellulose ethers containing tertiary or quaternary nitrogen. 4,940,785, Cl. 536-90.000.

Stoddard, Darrell: *See*—
Kittler, Wilfred C., Jr.; Czukor, Janos; and Stoddard, Darrell, 4,940,627, Cl. 428-203.000.

Stokker, Gerald E.: *See*—
Inamine, Edward S.; Hensens, Otto D.; Houck, David R.; Lee, Ta J.; Smith, Robert L.; Halczenko, Wasyl; Hartman, George D.; and Stokker, Gerald E., 4,940,727, Cl. 514-450.000.

Stoll, Noel E. Method and apparatus for sharpening knives. 4,939,869, Cl. 51-109.0BS.

Stoller, Kenneth P.: *See*—
Taff, Barry E.; and Stoller, Kenneth P., 4,940,058, Cl. 128-653.00R.

Stone, Wade J.: *See*—
Kelley, Edwin A.; and Stone, Wade J., 4,941,153, Cl. 375-36.000.

Stoof, Robert E. Glass cutting apparatus. 4,939,968, Cl. 83-886.000.

Stouffer Corporation, The: *See*—
Peleg, Yigal, 4,940,867, Cl. 219-10.55E.

Straaten, Paul: *See*—
Raasch, Hans; and Straaten, Paul, 4,939,895, Cl. 57-263.000.

Straede, Bjarne: *See*—
Kyster, Erik; Jakobsen, Niels-Henrik G.; Molbaek, Jens J.; Stenderup, Ole; and Straede, Bjarne, 4,940,538, Cl. 210-137.000.

Straight, Michael R.: *See*—
Roinestad, Gerald C.; and Straight, Michael R., 4,940,133, Cl. 198-831.000.

Straub, Albert H. Coaster carrier. 4,940,137, Cl. 206-139.000.

Strecker, William D.: *See*—
Shaffer, Stephen J.; Warren, Richard A.; Eggers, Thomas W.; and Strecker, William D., 4,941,088, Cl. 364-200.000.

Strohmeier, Fred, to Hewlett-Packard Company. Sample injector for a liquid chromatograph. 4,939,943, Cl. 73-864.210.

Stroup, Larry J. Gun silencer and muzzle protector. 4,939,977, Cl. 89-14.400.

Su, Sophia R.; Fitzpatrick, Leo F.; and Robillard, Sheryl A., to GTE Laboratories Incorporated. Method of making large particle size, high purity dense silica. 4,940,571, Cl. 423-339.000.

Suddeutsche Kuhlerfabrik Julius Fr. Behr GmbH & Co. KG: *See*—
Digele, Jorg, 4,940,121, Cl. 192-58.00B.

Sudo, Katsuichi: *See*—
Wakamatsu, Kaori; Kondo, Koichi; and Sudo, Katsuichi, 4,940,730, Cl. 514-560.000.

Sudol, Marion A.: *See*—
Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sudol, Marion A., 4,940,592, Cl. 426-94.000.

Sueki, Masao: *See*—
Terada, Matsuaki; Wataya, Hiroshi; Takagi, Satoru; and Sueki, Masao, 4,941,084, Cl. 364-200.000.

Sugano, Kazuhiko, to Nissan Motor Co., Ltd. Planetary gearing for automatic transmission. 4,939,955, Cl. 475-278.000.

Sugden, Kenneth B., to Sundstrand Corporation. Differential with bleed holes for deaeration of oil for lubricating journals. 4,940,115, Cl. 184-6.120.

Sugihara, Edna: *See*—
Cheng, Yu-Ling; Gale, Robert M.; Sugihara, Edna; and Sanders, Harold F., 4,940,586, Cl. 424-464.000.

Sugiyama, Takeshi: *See*—
Takenaka, Yasushi; Sugiyama, Takeshi; and Kajita, Shunsuke, 4,940,083, Cl. 165-42.000.

Sui, Masaru: *See*—
Miyamura, Noriyuki; Iwasa, Seizo; Asano, Hiroshi; Nagai, Isamu; Hamada, Hayato; Sasaki, Shuji; Kinoshita, Takeshi; and Sui, Masaru, 4,940,450, Cl. 474-152.000.

Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, to American Cyanamid Company. 7-(substituted)piperazinyl-1-ethyl-6-fluoro-1,4-dihydro-4-oxo-3-quinolinecarboxylic acids. 4,940,710, Cl. 514-254.000.

Sumitomo Chemical Companmy, Limited: *See*—
Takano, Hirotaka, 4,940,722, Cl. 514-383.000.

Sumitomo Chemical Company, Limited: *See*—
Itoh, Yoshikazu; Hatakoshi, Makoto; and Sasaki, Mitsuru, 4,940,699, Cl. 514-114.000.
Sasaki, Toshio; Ebara, Takeshi; and Kawai, Kiyoshi, 4,940,682, Cl. 502-113.000.

Sumitomo Electric Industries, Ltd.: *See*—
Kida, Yasushi, 4,941,142, Cl. 370-85.500.

Sumitomo Metal Industries, Ltd.: *See*—
Ohshima, Kazuhide; and Suzuki, Nobukazu, 4,940,639, Cl. 428-659.000.

Sumitomo Rubber Industries, Ltd.: *See*—
Nakaski, Eiji; and Igarashi, Yasuo, 4,940,069, Cl. 152-544.000.

Sumitomo Wiring Systems, Ltd.: *See*—
Fujitani, Mitsuhiro; Oka, Hiroyuki; and Hirano, Seiji, 4,940,430, Cl. 439-686.000.

Sumiya, Mitsuo: *See*—
Ueda, Katsunobu; Sumiya, Mitsuo; and Baba, Michio, 4,940,319, Cl. 350-613.000.

Summit Technology, Inc.: *See*—
Marshall, John; Raven, Anthony L.; Welford, Walter T.; and Ness, Karen M. M., 4,941,093, Cl. 364-413.010.

Sundstrand Corporation: *See*—
Sugden, Kenneth B., 4,940,115, Cl. 184-6.120.

Sung, Sun K., to Gold Star Co., Ltd. Noise-free skip search apparatus utilizing a piezo-electric element. 4,941,061, Cl. 360-10.200.

Suppelsa, Anthony B.: *See*—
Juskey, Frank J., Jr.; Miles, Barry M.; and Suppelsa, Anthony B., 4,940,181, Cl. 228-180.200.

Supra, Carl F. W., to Liberty Pool Products S.A. Pool cleaner. 4,939,806, Cl. 15-1.700.

Suprise, Jody D.: *See*—
Van Gompel, Paul T.; Suprise, Jody D.; and Schleinz, Robert J., 4,940,464, Cl. 604-396.000.

Suslow, Trevor V.; and Jones, Jonathan D. G., to DNA Plant Technology Corporation. Novel chitinase-producing bacteria and plants. 4,940,840, Cl. 800-205.000.

Suter, Larry: *See*—
Zimmerman, Richard J.; Barnett, Phillip R.; and Suter, Larry, 4,940,012, Cl. 118-301.000.

Sutherland, Thomas H.: *See*—
Hermansen, Ralph D.; Sutherland, Thomas H.; and Predmore, Roamer, 4,940,633, Cl. 428-324.000.

Sutter, Marius: *See*—
Bohlendorf, Bettina; Bedorf, Norbert; Hofle, Gerhard; Schummer, Dietmar; and Sutter, Marius, 4,940,804, Cl. 549-267.000.

Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, to Matsushita Electric Indus-

trial Co., Ltd. Method for production of copper indium diselenide. 4,940,604, Cl. 427-76.000.
Suyama, Takahiro: *See*—
Hayakawa, Toshiro; Suyama, Takahiro; and Yamamoto, Saburo, 4,941,024, Cl. 357-4.000.
Suzuki, Hideo, to Nippon Gakki Seizo Kabushiki Kaisha. Tone signal generation device having waveshape changing means. 4,939,973, Cl. 84-605.000.
Suzuki Jidosha Kogyo Kabushiki Kaisha: *See*—
Umehara, Kazuhiro, 4,940,965, Cl. 340-460.000.
Suzuki, Kazuo: *See*—
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.
Suzuki, Kenji: *See*—
Ito, Yasunobu; and Suzuki, Kenji, 4,941,096, Cl. 364-424.100.
Suzuki, Koji: *See*—
Sakai, Jun; Higashiyama, Shunichi; Suzuki, Koji; and Ohta, Mitsuru, 4,940,643, Cl. 430-108.000.
Suzuki, Masaaki: *See*—
Otsutani, Takeshi; Nakata, Yoshinori; Suzuki, Masaaki; and Akiyama, Takeo, 4,940,684, Cl. 502-178.000.
Suzuki, Masayuki: *See*—
Aihara, Yoshihiko; and Suzuki, Masayuki, 4,941,010, Cl. 354-407.000.
Suzuki, Nobukazu: *See*—
Ohshima, Kazuhide; and Suzuki, Nobukazu, 4,940,639, Cl. 428-659.000.
Suzuki, Norio: *See*—
Kobashi, Koji; Nishimura, Kozo; Miyata, Koichi; Kawate, Yoshio; Kumagai, Kazuo; Suzuki, Norio; Kawata, Yutaka; and Ishibashi, Kiyotaka, 4,940,015, Cl. 118-723.000.
Suzuki, Saburo; Nawa, Hiroshi; and Ito, Sadao, to Aisin Seiki Kabushiki Kaisha. Seat sliding apparatus for vehicles. 4,940,285, Cl. 297-473.000.
Suzuki, Takanori: *See*—
Miyashi, Tsutomu; Yamashita, Yoshiro; Suzuki, Takanori; and Fujii, Hiroshi, 4,940,832, Cl. 585-863.000.
Suzuki, Toshiro. Method of treating backfill. 4,940,366, Cl. 405-267.000.
Suzuta, Takeo: *See*—
Maki, Kazuya; Koyama, Hideo; and Suzuta, Takeo, 4,939,981, Cl. 91-166.000.
Svanberg, Joakim A.: *See*—
Larsson, Anders E. C.; Svanberg, Joakim A.; Kilstrom, Lars G.; and Tuvin, Lars G., 4,940,474, Cl. 55-210.000.
Svensson, Ulf; and Dahlgren, Bo, to Svensson, Ulf. Mobile work unit with raisable and lowerable support legs. 4,940,110, Cl. 180-209.000.
Swain, Christopher: *See*—
Baker, Raymond; Kneen, Clare O.; Saunders, John; and Swain, Christopher, 4,940,703, Cl. 514-210.000.
Swanson, Stephen D.: *See*—
Johnson, Andrew J.; Petersen, Robert D.; and Swanson, Stephen D., 4,940,865, Cl. 219-10.55A.
Swartz, Roy, to Delaware Investments, Inc. Material handling system and control valve thereof. 4,940,131, Cl. 198-524.000.
Swenson, Richard A. Spacer for reinforcing mesh and spiral reinforcement cages. 4,939,883, Cl. 52-686.000.
Swierenga, Brian S.: *See*—
Davidson, James G., III; and Swierenga, Brian S., 4,940,822, Cl. 568-812.000.
Swinburne, Stephen G.; Gelardi, Anthony L.; and Stiles, William, to Shape Inc. Injection molded center core for a recording disc and related method of manufacture. 4,941,066, Cl. 360-133.000.
Syntex (U.S.A.) Inc.: *See*—
MacFarlane, Calum B.; Selkirk, Alastair B.; and Dey, Michael J., 4,940,556, Cl. 264-15.000.
Sysko, Robert J.: *See*—
Sinay, Terry G., Jr.; and Sysko, Robert J., 4,940,791, Cl. 544-237.000.
Symo S.A.: *See*—
Horvath, Laszlo; Martin, Georges; and Schween, Heiner, 4,940,000, Cl. 104-295.000.
Szarka, Sandor, to Precision Screen Machines, Inc. Multicolor screen printing assembly. 4,939,991, Cl. 101-115.000.
Szklarz, Robert J.: *See*—
Rademacher, Kevin A.; Dean, Dennis R.; Dixon, Jerry L., Sr.; and Szklarz, Robert J., 4,941,165, Cl. 379-1.000.
Szyoboda nee Kanzel, Ida: *See*—
Paloai, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.
Tabatabaie, Nader, to Bell Communications Research, Inc. Quantum well semiconductor structures for infrared and submillimeter light sources. 4,941,025, Cl. 357-16.000.
Tachibana, Ryoichi: *See*—
Nakaji, Nobuo; Kojima, Hideki; and Tachibana, Ryoichi, 4,940,337, Cl. 366-148.000.
Tada, Atsushi. Manually operated trigger type dispenser, a spinner for use in the dispenser, and a flow-pattern switching mechanism for use in the dispenser. 4,940,186, Cl. 239-337.000.
Tada, Yoshihiko: *See*—
Nishii, Michiharu; Tada, Yoshihiko; and Mizuno, Genji, 4,940,290, Cl. 303-6.010.
Tadokoro, Shigeo; Morioka, Joji; and Takahashi, Hideyuki, to Tsuchiya Mfg. Co., Ltd. Filter medium forming system and process. 4,940,500, Cl. 156-204.000.
Taff, Barry E.; and Stoller, Kenneth P. Cryogenic remote sensing physiograph. 4,940,058, Cl. 128-653.00R.
Taguchi, Hanzo; Mantani, Rokurota; Murayama, Masatosi; and Nishino, Toshihiro, to Nippon Gakki Seizo Kabushiki Kaisha. Acoustic keyboard musical instrument. 4,939,969, Cl. 84-719.000.
Taguchi, Yukihiko, to Sanden Corp. Slant plate type compressor with variable displacement mechanism. 4,940,393, Cl. 417-222.000.
Taiyo Yuden Company, Ltd.: *See*—
Hamada, Emiko; Arai, Yuji; Shin, Yuaki; and Ishiguro, Takashi, 4,940,618, Cl. 428-64.000.
Takada, Hazime: *See*—
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.
Takada, Susumu; Fujishita, Toshio; Sasatani, Takashi; Matsushita, Akira; and Eigyo, Masami, to Shionogi & Co., Ltd. 2-substituted carbonylimidazo[4,5-c]quinolines. 4,940,714, Cl. 514-293.000.
Takado, Yutaka: *See*—
Yamazaki, Masayuki; Takado, Yutaka; and Mikami, Takashi, 4,940,270, Cl. 293-122.000.
Takagi, Satoru: *See*—
Terada, Matsuaki; Wataya, Hiroshi; Takagi, Satoru; and Sueki, Masao, 4,941,084, Cl. 364-200.000.
Takahashi, Hideyuki: *See*—
Tadokoro, Shigeo; Morioka, Joji; and Takahashi, Hideyuki, 4,940,500, Cl. 156-204.000.
Takahashi, Hiroto: *See*—
Ikeda, Masami; Shibata, Makoto; Matsuda, Hiroto; and Takahashi, Hiroto, 4,940,999, Cl. 346-140.00R.
Takahashi, Tomonori, to NGK Insulators, Ltd. Silicon nitride sintered members. 4,940,680, Cl. 501-97.000.
Takahata, Katsumasa: *See*—
Maeno, Mikihiko; Ohta, Yukio; Momiyama, Yoshiharu; Ono, Hisao; Takahata, Katsumasa; Ozono, Kazuyuki; Shimizu, Makoto; and Yamamoto, Mikio, 4,940,222, Cl. 271-127.000.
Takamatsu, Koji: *See*—
Ichimura, Takashi; Takamatsu, Koji; Konuma, Takayuki; and Tsukui, Takaaki, 4,939,898, Cl. 60-274.000.
Takano, Hirotaka, to Sumitomo Chemical Companmy, Limited. Seed disinfectant composition. 4,940,722, Cl. 514-383.000.
Takano, Mitsuhiro: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.
Takao, Shoji: *See*—
Yamazaki, Ken-ichi; Takao, Shoji; and Yamamoto, Koji, 4,940,662, Cl. 435-68.100.
Takara Co., Ltd.: *See*—
Matsuda, Takashi, 4,940,442, Cl. 446-90.000.
Takara Shuzo Co., Ltd.: *See*—
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.
Takashima, Seikichi: *See*—
Fujita, Hajime; Chiba, Seishi; Okutomi, Tsutomu; Suzuki, Kazuo; Idehara, Masami; Honma, Mitsutaka; and Takashima, Seikichi, 4,940,863, Cl. 200-144.00B.
Takatoo, Masao: *See*—
Mishima, Tadaaki; Kanasaki, Morio; Takatoo, Masao; and Ota, Hideo, 4,941,192, Cl. 382-54.000.
Takeda, Atsushi; Itoh, Masahiro; and Tsuchiya, Hiroaki, to Canon Kabushiki Kaisha. Image forming apparatus. 4,941,003, Cl. 346-160.000.
Takeda Chemical Industries, Ltd.: *See*—
Wakamatsu, Kaori; Kondo, Koichi; and Sudo, Katsuichi, 4,940,730, Cl. 514-560.000.
Takeda, Etsuya: *See*—
Kawaguchi, Takao; Tamura, Tatsuhiko; and Takeda, Etsuya, 4,940,934, Cl. 324-158.00R.
Takenaka, Yasushi; Sugiyama, Takeshi; and Kajita, Shunsuke, to Nissan Shatai Company, Limited. Apparatus for conditioning air for a vehicle compartment. 4,940,083, Cl. 165-42.000.
Takeshima, Eiki, to Nisshin Steel Company Ltd. Process and apparatus for coating fine powders. 4,940,523, Cl. 204-192.120.
Takeshita, Osamu; Iwai, Takayuki; and Terauchi, Kenichi, to Dainippon Screen Mfg. Co., Ltd. Lead frame conveying apparatus. 4,940,217, Cl. 269-50.000.
Takiguchi, Haruhisa: *See*—
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Kudo, Hiroaki, 4,941,148, Cl. 372-96.000.
Takiura, Yasuro: *See*—
Satta, Yusuke; and Takiura, Yasuro, 4,941,094, Cl. 364-413.210.
Takizawa, Satoshi, to Nissan Motor Company Limited. System for controlling servo activating hydraulic pressure occurring in vehicular power train. 4,939,956, Cl. 74-858.000.
Takizawa, Yoshio: *See*—
Matsubara, Akitoshi; Ikeuchi, Satoru; Akimoto, Kunio; and Takizawa, Yoshio, 4,940,644, Cl. 430-109.000.
Talamini, Gianpietro: *See*—
Tonti, Sergio; Furlan, Piero; and Talamini, Gianpietro, 4,940,773, Cl. 528-315.000.
Tallmadge, Bruce J.: *See*—
Lensmire, Todd T.; Donald, Robert J.; Turley, Sheldon G.; and Tallmadge, Bruce J., 4,940,754, Cl. 525-80.000.
Tamagawa, Shigehisa; and Fuchizawa, Tetsuro, to Fuji Photo Film Co., Ltd. Photographic support. 4,940,656, Cl. 430-533.000.

Tamamura, Hideo: *See*—
Ogawa, Yukio; Ikawa, Kazuo; Shoji, Toru; Tamamura, Hideo; Nakayama, Hiroki; and Matsushita, Takashi, 4,941,070, Cl. 362-3.000.
Tamarack Scientific Co., Inc.: *See*—
Sheets, Ronald E., 4,940,881, Cl. 219-121.690.
Tamura, Hisao: *See*—
Sakamoto, Daishiro; Mouri, Takayuki; and Tamura, Hisao, 4,940,266, Cl. 292-227.000.
Tamura, Tatsuhiko: *See*—
Kawaguchi, Takao; Tamura, Tatsuhiko; and Takeda, Etsuya, 4,940,934, Cl. 324-158.00R.
Tamura, Toshinari: *See*—
Tsukamoto, Shin-ichi; Nagaoka, Hitoshi; Usuda, Shinji; Harada, Masatomi; and Tamura, Toshinari, 4,940,795, Cl. 546-16.000.
Tan, Chee-Teck: *See*—
Byrne, Brian; Miller, Kevin P.; Tan, Chee-Teck; Buckholz, Lawrence L., Jr.; and Sadol, Marion A., 4,940,592, Cl. 426-94.000.
Tanabe, Ken: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.
Tanabe, Shuji: *See*—
Naito, Seishi; Tanabe, Shuji; and Nakashima, Toru, 4,940,938, Cl. 324-212.000.
Tanagho, Emil A.; Schmidt, Richard A.; Gleason, Curtis A.; and Lue, Tom F., to University of California, Regents of the. Surgically implantable peripheral nerve electrode. 4,940,065, Cl. 128-784.000.
Tanaka, Akira; Miura, Hidetoshi; and Koga, Masao, to Mitsubishi Paper Mills Limited. Photographic spectral sensitizing dye. 4,940,657, Cl. 430-578.000.
Tanaka, Hideaki; Morita, Toshiaki; and Konya, Minehiro, to Sharp Kabushiki Kaisha. Optical character reader. 4,941,195, Cl. 382-61.000.
Tanaka, Hisao: *See*—
Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, 4,940,542, Cl. 210-321.800.
Tanaka, Kazuyoshi: *See*—
Hara, Makoto; Hashiue, Masakazu; and Tanaka, Kazuyoshi, 4,941,092, Cl. 364-413.150.
Tanaka, Yukitaka: *See*—
Hirota, Yoshitaka; Tanaka, Yukitaka; and Urata, Kouichi, 4,940,845, Cl. 435-134.000.
Tandem Computers Incorporated: *See*—
Herbst, Noel M., 4,941,170, Cl. 379-100.000.
Tandler, John J.: *See*—
Spatz, Mark W.; and Tandler, John J., 4,939,906, Cl. 62-94.000.
Taniguchi, Takashi; and Seki, Tetsuya, to Toray Industries, Inc. Process of producing an anti-reflection optical article. 4,940,602, Cl. 427-40.000.
Taniguchi, Tsutomu: *See*—
Kawano, Yukita; Kusakabe, Katsuhiko; Maruyama, Hitoshi; Matsui, Susumu; Taniguchi, Tsutomu; and Obayashi, Akira, 4,940,837, Cl. 800-200.000.
Tanimori, Shigeru: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.
Tanuma, Jiro: *See*—
Kikuchi, Hiroshi; Tanuma, Jiro; Ishimizu, Hideaki; and Komori, Chihiro, 4,940,343, Cl. 400-124.000.
Tararuj, Christopher; and Schaab, Carl K., to Webcraft Technologies. Fragrance enhanced powder sampler and method of making the same. 4,940,584, Cl. 424-401.000.
Tatsuno, Kyoichi, to Kabushiki Kaisha Toshiba. Particle size measuring apparatus. 4,940,326, Cl. 356-336.000.
Taux, Guenter: *See*—
Dopheide, Dietrich; Faber, Michael; Taux, Guenter; and Reim, Gerhard, 4,940,330, Cl. 356-28.500.
Tawada, Yoshihisa: *See*—
Kobayashi, Kenji; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,941,032, Cl. 357-67.000.
Tayefeh, Morovat: *See*—
Kulakowski, John E.; Means, Rodney J.; Oldham, David M.; and Tayefeh, Morovat, 4,941,139, Cl. 369-54.000.
Taylor, Billy K., to NCR Corporation. Slow peripheral handshake interface circuit. 4,941,157, Cl. 375-121.000.
Taylor, Charles S.: *See*—
Hampton, Hilary J.; Gaiser, John W.; Taylor, Charles S.; and Machold, Timothy R., 4,940,062, Cl. 128-772.000.
Taylor, Danny R., to Databook, Inc. Apparatus and method for indicating when it is safe and unsafe to insert a memory cartridge into or remove a memory cartridge from a memory cartridge receiving device. 4,940,969, Cl. 340-653.000.
Taylor, James L.: *See*—
Beaton, William I.; Taylor, James L.; Peck, Lawrence B.; and Mosby, James F., 4,940,529, Cl. 208-61.000.
Taylor, John W., Jr.; and Sorrell, Perry A., to Westinghouse Electric Corp. Radar stability measurement system. 4,940,985, Cl. 342-174.000.
Taylor, John W., Jr., to Westinghouse Electric Corp. Two parameter clutter map. 4,940,988, Cl. 342-93.000.
Taylor, Marc F. Evaporative precooler air-conditioning system. 4,939,907, Cl. 62-95.000.
Taylor, William J.; Weiss, Douglas; and Lessar, Joseph F., to Medtronic, Inc. Implantable pulse generator feedthrough. 4,940,858, Cl. 174-152.0GM.
Techni Contact: *See*—
Petit, Nicaise; and Moisset, Jean-Claude, 4,940,494, Cl. 134-1.000.
TECON GmbH: *See*—
Vogelpohl, Alfons; and Rabiger, Norbert, 4,940,546, Cl. 210-613.000.
Tel-Instrument Electronics Corporation: *See*—
Helfrick, Albert D., 4,940,950, Cl. 331-2.000.
Telectronics N.V.: *See*—
Grevis, Richard; and Gilli, Norma L., 4,940,054, Cl. 128-419.0PG.
Telepanel, Inc.: *See*—
Soubliere, Marc P., 4,939,861, Cl. 40-651.000.
Temelli, Sedat, to Mullverbrennungsanlage Wuppertal GmbH. Process for incineration of refuse. 4,940,006, Cl. 110-243.000.
Temple, Stephen: *See*—
Paton, Anthony D.; Temple, Stephen; and Shepherd, Mark R., 4,940,996, Cl. 346-140.00R.
Temple, Victor A. K., to General Electric Company. Semiconductor devices exhibiting minimum on-resistance. 4,941,026, Cl. 357-23.400.
Templeton, Darrel L., to Hunter Contracting Company. Protection structure for heavy equipment. 4,940,280, Cl. 296-190.000.
Ten Pro Corporation: *See*—
Magadini, John A., 4,940,247, Cl. 273-72.00A.
Terada, Matsuaki; Wataya, Hiroshi; Takagi, Satoru; and Sueki, Masao, to Hitachi, Ltd. System for locating resources resided in a distributing processing system by sequentially transmitting resource inquiries through a looped transmission line. 4,941,084, Cl. 364-200.000.
Teramachi, Hiroshi. Composite motion guide device. 4,939,946, Cl. 74-89.150.
Terauchi, Kenichi: *See*—
Takeshita, Osamu; Iwai, Takayuki; and Terauchi, Kenichi, 4,940,217, Cl. 269-50.000.
Terauchi, Kiyoshi: *See*—
Shimizu, Shigemi; Kikuchi, Kazuto; and Terauchi, Kiyoshi, 4,940,396, Cl. 417-410.000.
Terhorst, Hans: *See*—
Grabietz, Joachim, 4,940,024, Cl. 122-13.00R.
Ternansky, Robert J.: *See*—
Barnett, Charles J.; Holmes, Richard E.; Jungheim, Louis N.; Sigmund, Sandra K.; and Ternansky, Robert J., 4,940,718, Cl. 514-370.000.
Terrain SDP, S.A.: *See*—
Uriarte Odriozola, Jose I., 4,940,260, Cl. 285-3.000.
Terral, Ben D. Latching device. 4,940,089, Cl. 166-117.500.
Terumo Kabushiki Kaisha: *See*—
Yamazaki, Ken-ichi; Takao, Shoji; and Yamamoto, Koji, 4,940,662, Cl. 435-68.100.
Terwilliger, Richard A.; Hebert, Daniell; and Hall, Jack, to Ingress Technologies, Inc. Biopsy instrument. 4,940,061, Cl. 128-754.000.
Teshima, Takeo; and Konno, Makoto, to Mitsubishi Denki Kabushiki Kaisha. Numerical control apparatus for controlling a threading operation. 4,941,104, Cl. 364-474.300.
Tessmann, Detlef: *See*—
Grapentin, Hans-Joachim; Seidenspinner, Hubert-Matthias; and Tessmann, Detlef, 4,940,554, Cl. 252-357.000.
Tetrafluor, Inc.: *See*—
Janian, Robert, 4,939,830, Cl. 29-173.000.
Texaco Chemical Co.: *See*—
Speranza, George P.; and Lin, Jiang-Jen, 4,940,770, Cl. 528-111.000.
Texas Instruments Inc.: *See*—
Hashimoto, Masashi, 4,941,127, Cl. 365-189.010.
Thompson, E. Earle, 4,941,123, Cl. 364-200.000.
Tso, Stephen T.; Bouldin, David L.; Calley, Mark R.; and Tipton, Charlotte M., 4,940,509, Cl. 156-653.000.
Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Williston, John P.; Rice, Haradon J.; and Doty, Thomas J., 4,940,925, Cl. 318-587.000.
Textron Inc.: *See*—
Marvell, Michael D.; and Milliser, John S., 4,940,375, Cl. 411-181.000.
Ryder, Francis E.; and Lisak, Stephen P., 4,939,945, Cl. 74-89.130.
Thaniyavarn, Suwat, to Boeing Company, The. Optical switch based on 1×2 directional coupler. 4,940,305, Cl. 350-96.140.
Theeuwes, Felix; Wong, Patrick S.-L.; Cortese, Richard; and Eckenhoff, James B. Dispenser comprising displaceable matrix with solid state properties. 4,940,465, Cl. 604-892.100.
Theurer, Josef, to Fran Plasser Bahnbaumaschinen-Industriegesellschaft m.b.H. Ballast tamping machine. 4,939,998, Cl. 104-12.000.
Thibieroz, Jean-Pierre A. M.: *See*—
Andrieu, Andre; Davot, Jean-Pierre P.; and Thibieroz, Jean-Pierre A. M., 4,940,635, Cl. 428-408.000.
Thie, Matthew G., to Autovend, Inc. Rolled coin dispenser. 4,940,162, Cl. 221-129.000.
Tholance, Michel: *See*—
Lessi, Jacques; and Tholance, Michel, 4,940,094, Cl. 166-373.000.
Thomas, Horace F., to CoreTank, Inc. Double containment and leak detection apparatus. 4,939,833, Cl. 29-401.000.
Thomas, Julian: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas,

Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Thome, John R.; and Yu, Sypyng B., to Motorola, Inc. Method for measuring the accuracy of insertion equipment. 4,939,942, Cl. 73-865.900.

Thompson, Danny R.: *See*—
Lau, Philip T. S.; and Thompson, Danny R., 4,940,812, Cl. 560-12.000.

Thompson, E. Earle, to Texas Instruments Incorporated. Data communications system with automatic communications mode. 4,941,123, Cl. 364-200.000.

Thompson, Ian A., to R & C Products Pty. Limited. Animal repellent composition and method. 4,940,583, Cl. 424-195.100.

Thomson-CSF: *See*—
Henry, Yves; and Arques, Marc, 4,940,901, Cl. 250-370.090.

Thonnessen, Franz: *See*—
Weber, Jurgen; Kampmann, Detlef; Thonnessen, Franz; and Kniep, Claus, 4,940,818, Cl. 564-471.000.

Thorin, Cedric L. M. C.: *See*—
Apap, Marc F. C.; Thorin, Cedric L. M. C.; Rosenstatter, Otto; and Malata, Peter, 4,940,410, Cl. 433-102.000.

Thorwart, Werner; Gebert, Ulrich; Schleyerbach, Rudolf; and Bartlett, Robert R., to Hoechst Aktiengesellschaft. 5-(3-alkyl-5-tert.butyl-4-hydroxyphenyl)-2-amino-6H-1,3,4-thiadiazines. 4,940,790, Cl. 544-8.000.

Thuries, Edmond; Pham, Van Doan; and Ledru, Roger, to Societe Anonyme dite : Alsthom. Braking resistor for a high tension electrical network. 4,940,961, Cl. 338-21.000.

Tice, Thomas E., to Analog Devices, Inc. Input stage for flash A/D converter. 4,940,980, Cl. 341-159.000.

Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., to University of North Carolina, Chapel Hill. Use of bis-(5-amidino-2-benzimidazolyl) methane (BABIM) to treat arthritis. 4,940,723, Cl. 514-396.000.

Tieke, Bernd: *See*—
Wegmann, Alex; Tieke, Bernd; and Hilti, Bruno, 4,940,516, Cl. 204-14.100.

Tilidetzke, Steven J.: *See*—
O'Connor, David F.; Dickover, Wesley; and Tilidetzke, Steven J., 4,940,116, Cl. 186-61.000.

Tillion, Diana R. Cultured mussel cleaning machine. 4,939,814, Cl. 17-74.000.

Tingley, Todd J. Game apparatus. 4,940,242, Cl. 273-287.000.

Tipton, Charlotte M.: *See*—
Tso, Stephen T.; Bouldin, David L.; Calley, Mark R.; and Tipton, Charlotte M., 4,940,509, Cl. 156-653.000.

Tischendorf, Reinhard: *See*—
Becker-Ross, Helmut; Florek, Stefan; Tischendorf, Reinhard; Engel, Klaus-Eberhard; Matzke, Wolf-Ekkehard; and Engel, Susanne, 4,940,325, Cl. 356-328.000.

Tittel, Eberhard. Car-top carrier. 4,940,175, Cl. 224-324.000.

Tobler, Hans: *See*—
Muller, Urs; Tobler, Hans; Rempfler, Hermann; and Meyer, Alfred, 4,940,481, Cl. 71-76.000.

Todd, Craig C.: *See*—
Mandell, Douglas E.; Todd, Craig C.; Allen, Ioan R.; and Davis, Mark F., 4,941,177, Cl. 381-22.000.

Tokai Kogyo Kabushiki Kaisha: *See*—
Unuma, Sadao, 4,940,449, Cl. 474-140.000.

Tokuhara, Masaharu: *See*—
Motoe, Hisafumi; Kawashima, Hiroyuki; and Tokuhara, Masaharu, 4,941,046, Cl. 358-167.000.

Tokyo Bi-Tech Laboratories, Inc.: *See*—
Aoyagi, Juuro, 4,940,541, Cl. 210-321.800.

Tolco Corporation: *See*—
Spengler, William E., 4,940,150, Cl. 211-188.000.

Tomei Sangyo Kabushiki Kaisha: *See*—
Simizu, Kazuo; Sakai, Shin; Matsumoto, Satoru; Yamamoto, Osamu; and Tanaka, Hisao, 4,940,542, Cl. 210-321.800.

Tonen Sekiyukagaku K.K.: *See*—
Yamazaki, Masayuki; Takado, Yutaka; and Mikami, Takashi, 4,940,270, Cl. 293-122.000.

Tonti, Sergio; Furlan, Piero; and Talamini, Gianpietro, to Montedipe S.p.A. Process for producing modified, impact-resistant polyamides with lactam-blocked diisocyanate/monoisocyanate. 4,940,773, Cl. 528-315.000.

Tooley, Patricia A.; and Kolts, John H., to Phillips Petroleum Company. Catalyst for oxidation of carbon monoxide. 4,940,686, Cl. 502-327.000.

Topfl, Werner; Meyer, Willy; and Schneider, Hans-Dieter, to Ciba-Geigy Corporation. Herbicidal sulfonylureas. 4,940,792, Cl. 544-321.000.

Toppan Printing Co., Ltd.: *See*—
Nakaji, Nobuo; Kojima, Hideki; and Tachibana, Ryoichi, 4,940,337, Cl. 366-148.000.

Toray Industries, Inc.: *See*—
Taniguchi, Takashi; and Seki, Tetsuya, 4,940,602, Cl. 427-40.000.

Torii, Katsuhiko: *See*—
Harada, Hiroyuki; Kurahashi, Kazuyoshi; Yamamura, Kengo; Higuchi, Youji; Fukatsu, Yasuhiro; and Torii, Katsuhiko, 4,939,867, Cl. 49-349.000.

Torres, Anthony R.: *See*—
Pawliszyn, Janusz B., 4,940,333, Cl. 356-432.000.

Torrington Company, The: *See*—
Grillo, John M.; Hilby, James A.; Fleet, Vern V.; Gardella, Cameron G.; and Hill, Gary J., 4,940,936, Cl. 324-174.000.

Tortorici, Frank J.; and Nelson, Jimmy L., to Eastman Kodak Company. Insolubilizing system for water based inks. 4,940,744, Cl. 524-437.000.

Tosoh Corporation: *See*—
Matsuba, Takao; Kubo, Masashige; Kagawa, Takumi; Oyama, Kiyotaka; and Kawabata, Koji, 4,940,802, Cl. 548-462.000.

Tottori Sanyo Electric Co., Ltd.: *See*—
Yasumoto, Masami; Motoike, Tatsuya; and Sawasa, Toshiyuki, 4,941,072, Cl. 362-249.000.

Tottori, Takeshi; Fujiwara, Hideo; and Inagoya, Osamu, to Hitachi Maxell, Ltd. Magnetic head having a pair of cores in which the opposing surfaces thereof are coated with a non-magnetic layer and a low melting point glass layer. 4,941,064, Cl. 360-120.000.

Touwslager, Fredericus J.: *See*—
Ponjee, Johannes J.; Touwslager, Fredericus J.; and Camps, Ivo G. J., 4,940,673, Cl. 437-225.000.

Townsend Engineering Company: *See*—
Townsend, Ray T., 4,940,597, Cl. 426-413.000.

Townsend, John A. Chassis frame for a wheeled motor vehicle. 4,940,282, Cl. 296-204.000.

Townsend, Ray T., to Townsend Engineering Company. Method of lubricating the passage of meat emulsion through the stuffing horn of a meat emulsion encasing machine. 4,940,597, Cl. 426-413.000.

Toyama, Yoshikuni: *See*—
Kasamura, Toshirou; Ohashi, Masashi; Kusumoto, Toshihiko; Okuda, Naoki; Sasaki, Nobukazu; Maeda, Yasunori; Kimura, Akiyoshi; Munenaka, Katsumi; Toyama, Yoshikuni; Nada, Minoru; Tanabe, Ken; Ikeda, Masamichi; Hishikawa, Yasuhide; and Ozawa, Takashi, 4,941,018, Cl. 355-245.000.

Toyo Boseki Kabushiki Kaisha: *See*—
Shizuki, Tatsuhiko; Ban, Kaoru; Yoshida, fumikazu; and Ohguchi, Masakatsu, 4,940,560, Cl. 264-211.000.

Toyoda Koki Kabushiki Kaisha: *See*—
Kawasaki, Hisamitsu; Nakashima, Kunimichi; Araki, Kazunori; and Mizuno, Tsuyoshi, 4,939,834, Cl. 29-568.000.

Toyoshima, Hiromitsu; Yoneda, Hirokazu; Ueno, Hiroshi; and Hatabu, Shoji, to Koyo Seiko Co., Ltd. Rack and pinion type steering apparatus. 4,939,947, Cl. 74-422.000.

Toyota Jidosha Kabushiki Kaisha: *See*—
Hasegawa, Akira, 4,940,104, Cl. 180-132.000.
Inui, Masaki; Okada, Mitsuhiko; Kubo, Seitoku; Okuda, Shozoh; and Hosono, Masaki, 4,940,446, Cl. 474-91.000.
Sato, Kiyoomi; Ushijima, Fumihiro; and Murata, Kiyohito, 4,940,125, Cl. 192-85.0AA.
Yasui, Yasuyoshi, 4,939,953, Cl. 475-233.000.

Tran, Nang T.: *See*—
Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank R.; Gilbert, James R.; and Aspen, Frank E., 4,940,495, Cl. 136-256.000.

Tran, Thang M., to Advanced Micro Devices, Inc. Method and apparatus for reducing critical speed path delays. 4,940,908, Cl. 307-443.000.

Trana, Roger M.: *See*—
Nelson, Michael D.; Wong, Heimen; and Trana, Roger M., 4,940,204, Cl. 248-688.000.

Trauth, Hubert: *See*—
Aumueller, Alexander; Spang, Peter; Neumann, Peter; and Trauth, Hubert, 4,940,742, Cl. 524-93.000.

TRC Companies Inc.: *See*—
Lilienfeld, Pedro, 4,940,327, Cl. 356-338.000.

Trew, Timothy I. P., to U.S. Philips Corporation. Processing sub-sampled signals. 4,941,044, Cl. 358-138.000.

Tri-Bio, Inc.: *See*—
McDowell, Curtis S., 4,940,540, Cl. 210-150.000.

Tribble, Lura L. Vehicle rear view mirror. 4,940,320, Cl. 350-616.000.

Tribune Publishing Company: *See*—
Williams, Ronald E., 4,940,160, Cl. 221-34.000.

Trinity Industrial Corporation: *See*—
Katsuyama, Kazuo, 4,940,207, Cl. 251-65.000.

Triplett, James T.: *See*—
Pithouse, Kenneth B.; Kridl, Thomas A.; Triplett, James T.; and Wille, Marc, 4,940,820, Cl. 428-34.900.

Triplett, Roger L.: *See*—
Lehmbeck, Donald R.; Triplett, Roger L.; and Marks, Kevin E., 4,941,057, Cl. 358-443.000.

Tronzo, Raymond G. Variable length fixation device. 4,940,467, Cl. 606-66.000.

Trovato, Stephen A.; Lefkowitz, Sheldon; and Eckert, Robert J. Scabbler for scabbling floors contaminated with hazardous materials. 4,940,289, Cl. 299-37.000.

Truelove, Kevin M.: *See*—
Herrick, Phillip R.; Ewing, Daniel C.; Wright, Floyd H.; and Truelove, Kevin M., 4,940,932, Cl. 324-158.0MG.

Trumpf GmbH & Co.: *See*—
Klingel, Hans; and Doettling, Juergen, 4,940,880, Cl. 219-121.670.

Trutzschler GmbH & Co. KG: *See*—
Leifeld, Ferdinand, 4,939,815, Cl. 019-105.000.

TRW Inc.: *See*—
Hanisko, John-Cyril P., 4,940,107, Cl. 180-142.000.

Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, to BASF Aktiengesellschaft. Polymeric conditioner for pretreating nonmetallic surfaces for chemical metallization. 4,940,609, Cl. 427-304.000.

Tschang, Pin S.: *See*—
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tschang, Pin S.; and Zeise, Eric K., 4,941,004, Cl. 346-160.000.

Tseng, Hsiaopin: *See*—
Neal, Lewis G.; Haulbeck, John L.; and Tseng, Hsiaopin, 4,940,569, Cl. 423-239.000.
Tso, Stephen T.; Bouldin, David L.; Calley, Mark R.; and Tipton, Charlotte M., to Texas Instruments, Incorporated. Isotropic etchant for capped silicide processes. 4,940,509, Cl. 156-653.000.
Tsuchiya, Hiroaki: *See*—
Takeda, Atsushi; Itoh, Masahiro; and Tsuchiya, Hiroaki, 4,941,003, Cl. 346-160.000.
Tsuchiya Mfg. Co., Ltd.: *See*—
Tadokoro, Shigeo; Morioka, Joji; and Takahashi, Hideyuki, 4,940,500, Cl. 156-204.000.
Tsuchiya, Yoshikazu: *See*—
Aihara, Yasuyuki; Kano, Hideki; Tsuchiya, Yoshikazu; and Miyazaki, Noboru, 4,940,423, Cl. 439-369.000.
Tsuchiyama, Yuji; and Hosoya, Masakazu, to Sanyo Electric Co., Ltd. Control apparatus for air conditioner. 4,939,909, Cl. 62-158.000.
Tsuge, Kazunori: *See*—
Kobayashi, Kenji; Kondo, Masataka; Tsuge, Kazunori; and Tawada, Yoshihisa, 4,941,032, Cl. 357-67.000.
Tsujimoto, Keizo: *See*—
Matsumoto, Tetsuo; Tsujimoto, Keizo; Matsuzawa, Katsuto; Hamada, Shunichiro; Shinogi, Kouzi; Nagai, Satomi; Imamura, Takayuki; and Kuroyanagi, Akiko, 4,940,772, Cl. 528-272.000.
Tsukada, Hiromi: *See*—
Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, 4,941,128, Cl. 365-203.000.
Tsukamoto, Shin-ichi; Nagaoka, Hitoshi; Usuda, Shinji; Harada, Masatoemi; and Tamura, Toshinari, to Yamanouchi Pharmaceutical Co., Ltd. Heterocyclic spiro compounds and methods for preparing the same. 4,940,795, Cl. 546-16.000.
Tsukida, Robert S., to General Electric Company. Post-accident sample station needle seal. 4,939,940, Cl. 73-864.740.
Tsukui, Takaaki: *See*—
Ichimura, Takashi; Takamatsu, Koji; Konuma, Takayuki; and Tsukui, Takaaki, 4,939,898, Cl. 60-274.000.
Tsutomu Miyashi: *See*—
Miyashi, Tsutomu; Yamashita, Yoshiro; Suzuki, Takanori; and Fujii, Hiroshi, 4,940,832, Cl. 585-863.000.
Tucker, Richard B. C.; Davis, Jackie L.; and Lewis, Fielding H., Jr., to Wm. T. Burnett & Co., Inc. Lacrosse stick. 4,940,243, Cl. 273-326.000.
Tuggle, Lloyd H., to White Consolidated Industries, Inc. Recoil pull rope reel apparatus for internal combustion engines. 4,940,028, Cl. 123-185.008.
Turley, Sheldon G.: *See*—
Lensmire, Todd T.; Donald, Robert J.; Turley, Sheldon G.; and Tallmadge, Bruce J., 4,940,754, Cl. 525-80.000.
Turner, Charles R., to John C. Garvin, Jr. & Harold W. Hilton. Exhaust ventilator. 4,939,986, Cl. 98-42.100.
Turner, John H. W.: *See*—
Laundon, Roy D.; Wickens, Anthony J.; and Turner, John H. W., 4,940,572, Cl. 423-633.000.
Tuttle, John O. Educational board game apparatus and method of using same. 4,940,239, Cl. 273-243.000.
Tuvin, Lars G.: *See*—
Larsson, Anders E. C.; Svanberg, Joakim A.; Kilstrom, Lars G.; and Tuvin, Lars G., 4,940,474, Cl. 55-210.000.
Twitty, William B.; and Sander, Wendell B., to Echelon Systems Corp. Protocol for network having a plurality of intelligent cells. 4,941,143, Cl. 370-85.200.
Uarco Incorporated: *See*—
Cuba, Ronald R., Jr.; and Jenkins, Roland, 4,940,258, Cl. 283-81.000.
Uchida, Takashi; Hoshino, Osamu; and Murayama, Yasushi, to Canon Kabushiki Kaisha. Image forming apparatus with recording material loop forming and control means. 4,941,021, Cl. 355-285.000.
Uchida, Yasuo: *See*—
Igarashi, Kimio; Uchida, Yasuo; and Matsui, Kenji, 4,941,181, Cl. 382-1.000.
Udagawa, Tetsu: *See*—
Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, 4,941,129, Cl. 365-230.030.
Udagawa, Yoshiro: *See*—
Sasaki, Takashi; and Udagawa, Yoshiro, 4,941,037, Cl. 358-80.000.
Ueda, Katsunobu; Sumiya, Mitsuo; and Baba, Michio, to Kabushiki Kaisha Toshiba. X-ray mirror apparatus and method of manufacturing the same. 4,940,319, Cl. 350-613.000.
Ueda, Takaharu: *See*—
Mizuno, Shigeki; Ueda, Takaharu; and Yamamoto, Tetsu, 4,940,924, Cl. 318-560.000.
Ueda, Yoshiteru, to Kawasaki Jukogyo Kabushiki Kaisha. Motor vehicle. 4,940,100, Cl. 180-68.100.
Uehara, Tsukasa, to Canon Kabushiki Kaisha. Recording and/or reproducing apparatus utilizing record bearing media of the disc type. 4,941,060, Cl. 360-99.050.
Ueno, Hiroshi: *See*—
Toyoshima, Hiromitsu; Yoneda, Hirokazu; Ueno, Hiroshi; and Hataba, Shoji, 4,939,947, Cl. 74-422.000.
Ueno, Noriyuki: *See*—
Suyama, Naoki; Ueno, Noriyuki; Omura, Kuniyoshi; Takada, Hazime; Kita, Yuutaro; and Murozono, Mikio, 4,940,604, Cl. 427-76.000.
Ueno, Shuichi, to Nissan Motor Co., Ltd. Seat belt holder position adjuster. 4,940,254, Cl. 280-808.000.
Uesaka, Toshio: *See*—
Iwasaki, Tetsuji; and Uesaka, Toshio, 4,940,582, Cl. 424-115.000.
Umehara, Kazuhiro, to Suzuki Jidosha Kogyo Kabushiki Kaisha. Vocal alarm for outboard engine. 4,940,965, Cl. 340-460.000.
Umemoto, Koichi: *See*—
Nemoto, Hiroshi; Umemoto, Koichi; and Kawasaki, Shinji, 4,940,960, Cl. 338-13.000.
Umetsu, Takao: *See*—
Kameyama, Nobuyuki; Umetsu, Takao; Masaoka, Tuyoshi; Onozuka, Haruo; Sato, Muneyoshi; and Okazaki, Yukio, 4,941,005, Cl. 354-195.100.
Umezu, Kenji; Ito, Hiroshi; and Ikeya, Jitsuo. Air conditioner. 4,939,910, Cl. 62-160.000.
Unger, Liliane: *See*—
Seitz, Werner; Unger, Liliane; Raschack, Manfred; Baldinger, Verena; Ruebsmen, Klaus; and Gries, Josef, 4,940,780, Cl. 558-388.000.
Ungerer, Heinz-Jurgen: *See*—
Naber, Wilfried; Ungerer, Heinz-Jurgen; and Sistermann, Klaus, 4,940,478, Cl. 65-27.000.
Union Oil Company of California: *See*—
Simpson, Howard D.; and Borgens, Pauline B., 4,940,533, Cl. 208-216.00R.
Unisys Corporation: *See*—
Couper, John, 4,940,224, Cl. 271-263.000.
U.S. News: *See*—
Winebaum, Jacob J.; Rider, Alan J.; and Querry, Lester R., 4,941,172, Cl. 379-355.000.
United States of America
Army: *See*—
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Shappirio, Joel R.; Aucoin, Thomas R.; and Finnegan, John J., 4,940,693, Cl. 505-1.000.
Energy: *See*—
Johnson, Andrew J.; Petersen, Robert D.; and Swanson, Stephen D., 4,940,865, Cl. 219-10.55A.
Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., 4,940,331, Cl. 356-349.000.
Health and Human Services: *See*—
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National Aeronautics and Space Administration: *See*—
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Navy: *See*—
Feinberg, Arthur R., 4,939,995, Cl. 102-214.000.
Rast, Howard E., 4,940,891, Cl. 250-227.150.
Welch, Jeanne A., 4,939,926, Cl. 73-49.300.
U.S. Philips Corporation: *See*—
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Brock, Lieselotte; Frank, Gunter; and Vitt, Bruno, 4,940,636, Cl. 428-426.000.
Habelt, Gerhard; and Mucha, Franz, 4,940,994, Cl. 346-76.0PH.
Hienerwadel, Klaus; and Weth, Gerald, 4,941,053, Cl. 358-261.200.
Kroontje, Wiggert; and van den Bogert, Willem J., 4,940,923, Cl. 315-248.000.
Martens, Jean B. O. S., 4,941,042, Cl. 358-133.000.
Opheij, Willem G.; and Braat, Josephus J. M., 4,940,890, Cl. 250-216.000.
Ponjee, Johannes J.; Touwslager, Fredericus J.; and Campa, Ivo G. J., 4,940,673, Cl. 437-225.000.
Sieborger, Gunther H. K. O., 4,941,080, Cl. 363-127.000.
Stil, Lambert J., 4,940,917, Cl. 313-414.000.
Trew, Timothy I. P., 4,941,044, Cl. 358-138.000.
U.S. Telecom International Inc.: *See*—
Kelly, Joseph J., Jr., 4,941,168, Cl. 379-69.000.
United Technologies Corporation: *See*—
Kromrey, Robert V., 4,940,563, Cl. 264-257.000.
Menard, Alan W., 4,940,074, Cl. 164-412.000.
University of Alberta, The Governors of the: *See*—
Schuller, Paul D.; Hatcher, David C.; Caelli, Terrance M.; Eggert, Frank M.; and Yuzyk, Jerome, 4,941,164, Cl. 378-205.000.
University of British Columbia: *See*—
Kharadly, Mostafa Z.; and Siu, Fredrick W. C., 4,940,990, Cl. 343-773.000.
University of California, Regents of the: *See*—
Tanagho, Emil A.; Schmidt, Richard A.; Gleason, Curtis A.; and Lue, Tom F., 4,940,065, Cl. 128-784.000.
University of Minnesota, Regents of the: *See*—
Nagasawa, Herbert T.; and Kwon, Chul-Hoon, 4,940,816, Cl. 564-103.000.
University of Missouri, The Curators of the: *See*—
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University of North Carolina, Chapel Hill: *See*—
Tidwell, Richard R.; Geratz, Joachim D.; Schwab, John H.; Pryzwansky, Katherine B.; and Anderle, Sonia K., 4,940,723, Cl. 514-396.000.
University of Pennsylvania: *See*—
MacDiarmid, Alan G., 4,940,640, Cl. 429-213.000.
University of Pittsburgh: *See*—
Marangoni, Roy D., 4,941,105, Cl. 364-506.000.
University of Southern Mississippi, The: *See*—
Mathias, Lon J.; and Cei, Gustavo, 4,940,796, Cl. 546-323.000.
University of Tennessee Research Corporation, The: *See*—
Mason, James M.; and Pifer, David D., 4,940,581, Cl. 424-532.000.

University of Toronto Innovations Foundation, The: *See*—
Sommerville, Iain D.; and Kemeny, Francis L., 4,940,486, Cl. 75-10.190.

University of Virginia Alumni Patents Foundation: *See*—
Brown, Michael F., 4,940,055, Cl. 128-653.00A.

University Patents, Inc.: *See*—
Allen, Robert H.; Stabler, Sally P.; and Lindenbaum, John, 4,940,658, Cl. 435-4.000.
Boyce, Stephen T.; and Ham, Richard G., 4,940,666, Cl. 435-240.200.

Unuma, Sadao, to Tokai Kogyo Kabushiki Kaisha. Paper feed tractor. 4,940,449, Cl. 474-140.000.

UOP: *See*—
Flanigen, Edith M.; Lok, Brent M.; Patton, Robert L.; and Wilson, Stephen T., 4,940,570, Cl. 423-306.000.
Peer, Roger L.; and Russ, Michael B., 4,940,532, Cl. 208-138.000.
Zinnen, Hermann A., 4,940,548, Cl. 210-656.000.
Zinnen, Hermann A.; and Fergin, Richard L., 4,940,830, Cl. 585-828.000.

Upperman, Eugene T.: *See*—
Carter, Hudson R.; and Upperman, Eugene T., 4,939,921, Cl. 73-1.00R.

Upton, Ralph G., to Sanders Associates, Inc. Multiple segment flextensional transducer shell. 4,941,202, Cl. 367-165.000.

Urashi, Seiichi: *See*—
Nogami, Yoshio; Matsuo, Yoshihiro; Fujii, Takayuki; and Urashi, Seiichi, 4,940,111, Cl. 180-219.000.

Urashima, Nobuaki: *See*—
Mori, Yoshikuni; Kushino, Mitsuo; Ikeda, Hayato; Urashima, Nobuaki; Izubayashi, Masuji; Tanimori, Shigeru; Arita, Yoshihiro; Kawamura, Kiyoshi; Minami, Kenji; and Sano, Yoshinori, 4,940,749, Cl. 524-547.000.

Urata, Kenji: *See*—
Kondo, Toshio; Urata, Kenji; Katagiri, Masayoshi; and Nakamura, Kenichi, 4,940,119, Cl. 188-73.310.

Urata, Kouichi: *See*—
Hirota, Yoshitaka; Tanaka, Yukitaka; and Urata, Kouichi, 4,940,845, Cl. 435-134.000.

Uriarte Odriozola, Jose I., to Terrain SDP, S.A. Fluid conduit coupling device. 4,940,260, Cl. 285-3.000.

Ushida, Yoshihisa; Hirai, Nobuki; and Mase, Hiroshi, to Mitsui Petrochemical Industries, Ltd. Ferroelectric ceramic material. 4,940,681, Cl. 501-134.000.

Ushijima, Fumihiro: *See*—
Sato, Kiyoomi; Ushijima, Fumihiro; and Murata, Kiyohito, 4,940,125, Cl. 192-85.0AA.

Usuda, Shinji: *See*—
Tsukamoto, Shin-ichi; Nagaoka, Hitoshi; Usuda, Shinji; Harada, Masatomi; and Tamura, Toshinari, 4,940,795, Cl. 546-16.000.

Utilicom Inc.: *See*—
Gastouniotis, Constantine S.; Bandeira, Nuno; and Wilson, Kitchener C., 4,940,976, Cl. 340-870.020.

Vadino, Winston A.: *See*—
Sangekar, Surendra; and Vadino, Winston A., 4,940,580, Cl. 424-80.000.

Van Alstine, Terrance L., to Nabisco Brands, Inc. Method for processing chewing gum. 4,940,594, Cl. 426-231.000.

Van de Loock, Guido: *See*—
Reinle, Erwin; and Van de Loock, Guido, 4,939,881, Cl. 52-565.000.

van den Bogert, Willem J.: *See*—
Kroontje, Wiggert; and van den Bogert, Willem J., 4,940,923, Cl. 315-248.000.

Vandenburgh, Herman H. Method for growing tissue specimens in vitro. 4,940,853, Cl. 435-240.230.

VanderSyde, Gary: *See*—
Haas, Dave; VanderSyde, Gary; Beatty, Paul; and Roxas, Ren, 4,939,887, Cl. 53-460.000.

Van Der Werf, Sylvie: *See*—
Girard, Marc; and Van Der Werf, Sylvie, 4,940,781, Cl. 530-350.000.

Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., to Shell Oil Company. Polymerization process. 4,940,683, Cl. 502-162.000.

Van Duyn, Phillip L.; Barenwald, Jorg R.; and Kruse, Kenneth E., to ACO Polymer Products, Inc. Chemical safety conduit or trench. 4,940,359, Cl. 405-118.000.

Van Gompel, Paul T.; Suprise, Jody D.; and Schleinz, Robert J., to Kimberly-Clark Corporation. Disposable incontinence garment or training pant. 4,940,464, Cl. 604-396.000.

Van Hovel, Brian V., to At Ease Enterprises, Inc. Portable, traveler's bath seat. 4,939,799, Cl. 4-578.000.

Van Leeuwen, Petrus W. N. M.: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.

Vanlerberghe, Guy: *See*—
Sebag, Henri; and Vanlerberghe, Guy, 4,940,573, Cl. 424-45.000.

Van Mechelen, Lambertus M. Supporting device. 4,940,220, Cl. 271-2.000.

VanOmmeren, Catharine L., to Atlas Powder Company. Emulsion explosive composition containing expanded perlite. 4,940,497, Cl. 149-2.000.

Van Oort, Aart B.: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.

Vartsky, David; Goldberg, Mark; Breskin, Amos; Engler, Gideon; Goldschmidt, Aharon; Izak, Ephraim; and Even, Ovadia, to State of Israel, Atomic Energy Commission, Soreq Nuclear Research Center, The. Method and system for detection of nitrogenous explosives by using nuclear resonance absorption. 4,941,162, Cl. 378-3.000.

Vassiliadis, Arthur; Shaffer, Joseph W.; Fullmer, David J.; Brewer, Michael H.; Hennings, David R.; and Myers, Terry D., to American Dental Laser, Inc. Dental laser method. 4,940,411, Cl. 433-215.000.

Vasvari, Lelle: *See*—
Hermecz, Istvan; Kereszturi, Geza; Vasvari, Lelle; Horvath, Agnes; Halogh, Maria; Ritli, Peter; Sipos, Judit; Pajor, Aniko ; and Marmarosi, Katalin, 4,940,794, Cl. 546-13.000.

VDO Adolf Schindling AG: *See*—
Mann, Arnold, 4,940,031, Cl. 123-339.000.
Ritzenthaler, Hugo; and Polando, Scott, 4,939,932, Cl. 73-317.000.
Ritzenthaler, Hugo A.; and Haub, Martin, 4,939,934, Cl. 73-431.000.

VE Holding Corp.: *See*—
Wyatt, W. Gerald; and Bleke, Jim, 4,939,988, Cl. 99-516.000.

Velbon International Corporation: *See*—
Hayakawa, Junichi, 4,940,203, Cl. 248-188.900.

Vemmer, Helmut, to Peter Lancier Maschinenbau-Hafenhuette GmbH & Co.,KG. Apparatus for measuring a traction force by means of a traction dynamometer. 4,939,939, Cl. 73-862.440.

Vendo Company, The: *See*—
Hieb, Larry E., 4,940,161, Cl. 221-67.000.

Vickers, John: *See*—
Morris, Michael; and Vickers, John, 4,940,849, Cl. 428-209.000.

Vicory, William A.: *See*—
Aberson, James A.; DeFabritis, Raymond P.; Ridgway, David N.; and Vicory, William A., 4,940,307, Cl. 350-96.210.

Victor Company of Japan, Ltd.: *See*—
Iwasaki, Yoshiki, 4,941,150, Cl. 375-1.000.

Videocolor: *See*—
Giannantonio, Guiseppe; and de Paolis, Cesare, 4,940,920, Cl. 315-8.000.

Vigmostad, Erik B.: *See*—
Klauber, Robert D.; and Vigmostad, Erik B., 4,939,937, Cl. 73-862.360.

Vincenzini, Franco, to Sasib S.p.A. Apparatus for filling trays with cigarettes. 4,939,886, Cl. 53-236.000.

Vineis, Donna L. Building assembly system. 4,940,149, Cl. 211-186.000.

Virag, Sandor: *See*—
Palosi, Endre; Korbonits, Dezso; Molnar nee Bako, Erzsebet; Szyoboda nee Kanzel, Ida; Harsing, Laszlo ; Simon, Gyorgy; Gergely, Vera; Kormoczi, Peter; Marmarosi nee Keliner, Katalin; and Virag, Sandor, 4,940,716, Cl. 514-307.000.

Virnig, Michael J.: *See*—
Schulz, Paul; Virnig, Michael J.; and Carduck, Franz J., 4,940,808, Cl. 549-436.000.

Viscodrive Japan Ltd.: *See*—
Sayama, Masayuki, 4,940,123, Cl. 192-58.00B.

Vitro Tec Fideicomiso: *See*—
Martinez-Soto, Alfredo; Loredo-Murphy, Jorge; and Becerril-Ortega, Benito, 4,940,480, Cl. 65-356.000.

Vitt, Bruno: *See*—
Brock, Lieselotte; Frank, Gunter; and Vitt, Bruno, 4,940,636, Cl. 428-426.000.

Voelz, Michael H., to Lafayette Instrument Co., Inc. Polygraph with improved cardiac monitoring. 4,940,059, Cl. 128-688.000.

Voest-Alpine Maschinenbau Gesellschaft m.b.H.: *See*—
Rieger, Johann; and Orasche, Hermann, 4,940,183, Cl. 238-310.000.

Voest-Alpine Stahl Donawitz Gesellschaft m.b.H.: *See*—
Lugscheider, Walter; and Pochmarski, Luzian, 4,940,487, Cl. 75-384.000.

Vogelpohl, Alfons; and Rabiger, Norbert, to TECON GmbH. Installation for aerobic biological purification of pollutant-containing water. 4,940,546, Cl. 210-613.000.

Vogt, Rolf: *See*—
Kilthau, Gerhard; Spies, Karl H.; Vogt, Rolf; Freilaender, Peter; and Seethaler, Toni, 4,940,248, Cl. 277-80.000.

Volante, Ralph P.: *See*—
Lynch, Joseph E.; Laswell, William L.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,520, Cl. 204-157.710.
Mills, Sander G.; Volante, Ralph P.; and Shinkai, Ichiro, 4,940,803, Cl. 549-302.000.

Volat, Jean-Pierre, to Bertin & Cie. Apparatus for forming a stack of flat objects such as letters. 4,940,219, Cl. 271-2.000.

Volkmann, Robert A., to Pfizer Inc. Process for optically active 3-thiolanyl sulfonate esters. 4,940,823, Cl. 568-844.000.

Vollmar, Herbert, to Walter Sarstedt Geraete und Verbrauchsmaterial fuer Medizin & Wissenschaft. Liquid storage container with closure cap. 4,940,154, Cl. 215-249.000.

von Benda, Klaus; Benczur-Urmossy, Gabor; and Berger, Gerhard, to Deutsche Automobilgesellschaft. Aqueous nickel hydroxide paste of high flowability. 4,940,553, Cl. 252-182.100.

Vonk, Glenn P.: *See*—
Wagner, Daniel B.; and Vonk, Glenn P., 4,940,669, Cl. 436-501.000.

Vonlanthen, Benno, to R. Berchtold AG. Electromechanical locking device. 4,939,915, Cl. 70-277.000.

Von Thun, Hans-Jurgen, to Asea Brown Boveri Aktiengesellschaft. Test bench for testing the drive train of a vehicle. 4,939,985, Cl. 73-118.100.

Vreeland, William B.: *See*—
Baughman, Richard C.; Fowlkes, William Y.; Rubin, Bruce J.; and Vreeland, William B., 4,941,020, Cl. 355-275.000.

W. E. McKenzie Limited: *See*—
Bircumshaw, Peter, 4,939,965, Cl. 82-113.000.

W. R. Grace & Co.-Conn: *See*—
Braatz, James A.; Heifetz, Aaron H.; Wolfe, Richard A.; and Luthra, Narender P., 4,940,737, Cl. 521-103.000.
Lussier, Roger J., 4,940,531, Cl. 208-120.000.
Mueller, Walter B.; and Schirmer, Henry G., 4,940,634, Cl. 428-349.000.

W. Schlafhorst & Co.: *See*—
Kuepper, Wilhelm; and Kamp, Heinz, 4,940,192, Cl. 242-35.50A.
Raasch, Hans; and Straaten, Paul, 4,939,895, Cl. 57-263.000.

Wada, Shouji; Komatsu, Nobuo; Takano, Mitsuhiro; Miyatake, Sinichi; Mihashi, Kazuo; and Tsukada, Hiromi, to Hitachi, Ltd.; and Hitachi VLSI Engineering Corp. Semiconductor memory device having means for providing a precharge voltage equivalent to a prescribed selection voltage. 4,941,128, Cl. 365-203.000.

Wada, Toshihide; and Watanabe, Yuichi, to Canon Kabushiki Kaisha. Printer having a variable interval between printing and carriage movement. 4,940,344, Cl. 400-144.200.

Wagaman, James P.; and Karlskind, Neil B. Pressure compensating connector assembly. 4,940,416, Cl. 439-204.000.

Wagner, Daniel B.; and Vonk, Glenn P., to Becton Dickinson and Company. Sac including a detectable metal marker and use thereof in an assay. 4,940,669, Cl. 436-501.000.

Wagner, Hildebert: *See*—
Keplinger, Klaus; Wagner, Hildebert; and Kreutzkamp, Barbara, 4,940,725, Cl. 514-411.000.

Wagner, Joseph P.: *See*—
Scott, Douglas R.; Goddard, Peggy L.; and Wagner, Joseph P., 4,940,915, Cl. 310-338.000.

Wago Verwaltungsgesellschaft mbH: *See*—
Hennemann, Lothar-Roland, 4,940,431, Cl. 439-716.000.

Waitl, Guenther; Birkmann, Rolf; and Schmidt, Ewald, to Siemens Aktiengesellschaft; and Electrovac GES.M.B.H. Hermetically tight glass-metal housing for semiconductor components and method for producing same. 4,940,855, Cl. 174-52.500.

Wajs, Georges: *See*—
Frances, Jean-Marc; and Wajs, Georges, 4,940,751, Cl. 525-54.200.

Wakamatsu, Kaori; Kondo, Koichi; and Sudo, Katsuichi, to Takeda Chemical Industries, Ltd. Angiogenesis enhancer. 4,940,730, Cl. 514-560.000.

Wakefield, David L.: *See*—
Culler, Scott R.; and Wakefield, David L., 4,940,607, Cl. 427-140.000.

Wakiya, Tadashi: *See*—
Hamamoto, Tadanao; Wakiya, Tadashi; and Hayasi, Kazunari, 4,940,322, Cl. 350-637.000.

Wako Pure Chemical Industries: *See*—
Hirai, Hidematsu; Hanada, Toshiro; Yamanishi, Kazuhiko; and Nohara, Hideko, 4,940,660, Cl. 435-7.000.

Waldman, Herbert H.; and Drebin, Kalman. Muting circuit for telephone answering machine. 4,941,166, Cl. 379-67.000.

Walega, William, to International Show Machine Corporation. Heel laster. 4,939,805, Cl. 12-10.500.

Walker, Frederick J.; and Melvin, Lawrence S., to Pfizer Inc. Derivatives of hydroxypyrimidines as leukotriene synthesis inhibitors. 4,940,712, Cl. 514-272.000.

Wallis, Bernard J. Cut-off machine. 4,939,967, Cl. 83-150.000.

Walowit, Eric, to Mead Corporation, The. Method for color image processing. 4,941,038, Cl. 358-80.000.

Walsh, Michael F., to Conopco, Inc. d/b/a/ Chesebrough-Pond's USA Co. Hair conditioning preparation. 4,940,576, Cl. 424-70.000.

Walter Sarstedt Gernete und Verbrauchsmaterial fuer Medizin & Wissenschaft: *See*—
Vollmar, Herbert, 4,940,154, Cl. 215-249.000.

Walz, Gerd: *See*—
Honel, Michael; Finke, Manfred; Walz, Gerd; and Ziegler, Peter, 4,940,768, Cl. 528-45.000.

Walz, Theo, to SIG Schweizerische Industrie-Gesellschaft. Apparatus for regrouping articles from a first conveyor to a second conveyor. 4,940,129, Cl. 198-418.600.

Walzer, Winfried; and Soemmer, Thomas, to Hydromatik GmbH. Drive system for machines and vehicles, with a hydraulic and mechanical transmission arranged thereafter. 4,939,954, Cl. 74-733.100.

Wand, Martin A.; Ho, Anh V.; Lin, Chuan-Fu; Huang, Phen-Lan; Willistos, John P.; Rice, Haradon J.; and Doty, Thomas J., to Texas Instruments Incorporated. Closed-loop navigation system for mobile robots. 4,940,925, Cl. 318-587.000.

Wandel, Dietmar: *See*—
Kretschmann, Bernd; and Wandel, Dietmar, 4,940,559, Cl. 264-130.000.

Wang, Pen C., to Shell Oil Company. Spirodilactam derivatives. 4,940,801, Cl. 548-410.000.

Wang, Tien-Wang. Vertical/horizontal double-way grinding type abrasive belt grinder. 4,939,870, Cl. 51-135.00R.

Wang, Wen-Ping. Modular construction unit. 4,939,880, Cl. 52-473.000.

Wankel GmbH: *See*—
Speiser, Josef; and Fischer, Manfred, 4,940,400, Cl. 418-61.200.

Warden, Scott L. Bifold privacy miniblind. 4,940,070, Cl. 160-176.100.

Wardlaw, Stephen C.; Levine, Robert A.; Rodriguez, Rodolfo R.; and Loken, Michael R., to Becton Dickinson and Company. Method for increasing agglutination of groups of cells to produce improved cell layer interface in centrifuged blood sample. 4,940,668, Cl. 436-174.000.

Waring, Peter, to Her Majesty the Queen in right of New Zealand. Variable flow rate pump for fluid. 4,940,035, Cl. 123-497.000.

Warner-Lambert Company: *See*—
Davidson, James G., III; and Swierenga, Brian S., 4,940,822, Cl. 568-812.000.
Lebrun, Jean C.; Kaltz, Jeffrey L.; and Love, Pressley A., 4,940,499, Cl. 156-69.000.

Warren, Richard A.: *See*—
Shaffer, Stephen J.; Warren, Richard A.; Eggers, Thomas W.; and Strecker, William D., 4,941,088, Cl. 364-200.000.

Warrington, Richard E.; Khan, Abbas A.; and Merril, Carl R., to Monoclonetics International, Inc. Screening extra-cellular body fluids for superoxide dismutase (SOD-1) for determining fetal trisomy 21 down syndrome. 4,940,659, Cl. 435-7.000.

Watanabe, Akiyoshi: *See*—
Chida, Naomichi; and Watanabe, Akiyoshi, 4,941,138, Cl. 369-44.410.

Watanabe, Harumi, to International Sankoh Kabushiki Kaisha. Package wrapping apparatus equipped with film hauling device. 4,939,889, Cl. 53-450.000.

Watanabe, Masaharu; and Monzen, Takashi, to Kitz Corporation. Filter element and method for manufacture thereof and micro-filtration filter having the filter element. 4,940,562, Cl. 264-234.000.

Watanabe, Michihiro: *See*—
Nagata, Tatsuya; Yamada, Takehiko; Hara, Eiichi; and Watanabe, Michihiro, 4,940,888, Cl. 250-208.100.

Watanabe, Naoki, to Mitsubishi Denki Kabushiki Kaisha. Method of restoring a wire electrode broken during an electric discharge machining operation. 4,940,871, Cl. 219-69.120.

Watanabe, Yuichi: *See*—
Wada, Toshihide; and Watanabe, Yuichi, 4,940,344, Cl. 400-144.200.

Wataya, Hiroshi: *See*—
Terada, Matsuaki; Wataya, Hiroshi; Takagi, Satoru; and Saeki, Masao, 4,941,084, Cl. 364-200.000.

Waters, Phillip N. Stretcher cover. 4,939,803, Cl. 5-414.000.

Watson, John L., to University of Missouri, The Curators of the. Multistep process for concentrating magnetic particles in waste sludges. 4,940,550, Cl. 210-695.000.

Webasto AG Fahrzeugtechnik: *See*—
Riedmaier, Josef; Widemann, Friedrich; and Schmatelka, Bernhard, 4,940,041, Cl. 126-110.00R.

Webcraft Technologies: *See*—
Tararuj, Christopher; and Schaab, Carl K., 4,940,584, Cl. 424-401.000.

Webcraft Technologies, Inc.: *See*—
Katz, Robert E.; Jones, John H.; Grainger, Frederick; Schoenleber, Donald W.; Hipko, George P.; Donahue, Patrick J.; Silverschotz, Stanford; and Hoffman, James, 4,939,888, Cl. 53-411.000.

Weber, Guenter, to Linde Aktiengesellschaft. Process and device for separating a sulfur-lye suspension. 4,939,817, Cl. 23-308.00S.

Weber, Heinz; Bleckmann, Gerhard; Dembek, Gerhard; Ehrmann, Gerd; Heinz, Gerhard; and Schlemmer, Lothar, to BASF Aktiengesellschaft. Fiber reinforced thermoplastic integral skin foams and manufacture thereof. 4,940,629, Cl. 428-213.000.

Weber, Jurgen; Kampmann, Detlef; Thonnessen, Franz; and Kniep, Claus, to Hoechst Aktiengesellschaft. Process on the preparation of 2,2'-oxybis(N,N-dimethyl-ethanamine). 4,940,818, Cl. 564-471.000.

Weber, Michael F.; Tran, Nang T.; Jeffrey, Frank R.; Gilbert, James R.; and Aspen, Frank E., to Minnesota Mining and Manufacturing Company. Photovoltaic device having light transmitting electrically conductive stacked films. 4,940,495, Cl. 136-256.000.

Weber, Myer M., to Semco Laboratories, Inc. Grease trap construction. 4,940,539, Cl. 210-149.000.

Webern doerfer, Volkmar: *See*—
Stange, Andreas; Degen, Hans-Juergen; Auhorn, Werner; Webern doerfer, Volkmar; Kroener, Michael; and Hartmann, Heinrich, 4,940,514, Cl. 162-168.200.

Wecker, Joachim: *See*—
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Wegmann, Alex; Tieke, Bernd; and Hilti, Bruno, to Ciba-Geigy Corporation. Process for the preparation of electroactive Langmuir-Blodgett layer system. 4,940,516, Cl. 204-14.100.

Weholt, Raymond L. Insulated tunnel liner and rehabilitation system. 4,940,360, Cl. 405-151.000.

Wei, Lee-Fang, to AT&T Bell Laboratories. Trellis coding method and arrangement for fractional bit rates. 4,941,154, Cl. 375-39.000.

Wei, Yen, to Drexel University. Polymerization of aniline and its derivatives. 4,940,517, Cl. 204-78.000.

Weick, Heinz H. Sun visor for motor vehicles. 4,940,272, Cl. 296-97.500.

Weideman, William E., to Recognition Equipment Incorp. Neural network image processing system. 4,941,122, Cl. 364-807.000.

Weigel, Albinus A. Wiregate closer. 4,940,265, Cl. 292-113.000.

Weigel, Peter; and Holland-Letz, Guenter, to Nixdorf Computer AG. Apparatus for receiving and orderly storing individual sheets in a container. 4,940,223, Cl. 271-181.000.

Weikert, Gunther: *See*—
Holzhauer, Horst; Schneider, Wolfgang; Weikert, Gunther; Kneib, Rudi; and Schumacher, Josef, 4,939,899, Cl. 60-412.000.

Weingartner, Thomas A.: *See*—
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Weinlich, Karl: *See*—
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Weiss, Douglas: *See*—
Taylor, William J.; Weiss, Douglas; and Lessar, Joseph F., 4,940,858, Cl. 174-152.0GM.

Weiss, Ekkehard: *See*—
Klaus, Michael; Mohr, Peter; and Weiss, Ekkehard, 4,940,707, Cl. 514-237.800.

Welch, Jeanne A., to United States of America, Navy. Apparatus and method for monitoring pressure leaks from a sealed system. 4,939,926, Cl. 73-49.300.

Welford, Walter T.: *See*—
Marshall, John; Raven, Anthony L.; Welford, Walter T.; and Ness, Karen M. M., 4,941,093, Cl. 364-413.010.

Wells, Robert L., Jr.: *See*—
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Wells, Thomas A.: *See*—
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Wertz, Jean-Luc: *See*—
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West, Joseph C., Jr.: *See*—
Brown, Richard I.; Cerny, David E.; Foley, John T.; and West, Joseph C., Jr., 4,940,543, Cl. 210-369.000.

Westergren, George A., to Whirlpool Corporation. Key system for vacuum cleaner hose connection. 4,940,415, Cl. 439-192.000.

Westinghouse Electric Corp.: *See*—
Ammon, Robert L.; Buckman, Raymond W., Jr.; and Bajaj, Ram, 4,940,404, Cl. 419-28.000.
Bluzer, Nathan, 4,941,029, Cl. 357-30.000.
Brandt, Gerald B., 4,940,316, Cl. 350-358.000.
Clark, Robert E.; and Amos, Dennis R., 4,940,390, Cl. 416-241.00R.
Elms, Robert T.; Peterson, Clyde O.; and Saletta, Gary F., 4,940,391, Cl. 417-12.000.
Fox, David A.; and Jessee, Ralph D., 4,941,075, Cl. 363-41.000.
Jenkins, Maurice A., 4,940,933, Cl. 324-158.0MG.
McKee, Bobby D.; and Nakagawa, Alvin H., 4,940,878, Cl. 219-121.640.
Ott, Howard L.; and Palm, Steven A., 4,940,025, Cl. 122-510.000.
Santilli, Vincent J., 4,940,862, Cl. 200-144.00B.
Schwirian, Richard E.; and Perone, Vincent A., 4,941,159, Cl. 376-458.000.
Silvestri, George J., Jr., 4,940,383, Cl. 415-44.000.
Steele, David S.; Armstrong, Randolph K.; and Snider, David E., 4,940,944, Cl. 324-425.000.
Taylor, John W., Jr.; and Sorrell, Perry A., 4,940,985, Cl. 342-174.000.
Taylor, John W., Jr., 4,940,988, Cl. 342-93.000.

Westphal, Dietmar B.: *See*—
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Weth, Gerald: *See*—
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Whillock, Allan A.: *See*—
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Whipple, Roger B.: *See*—
Osborn, Harold L.; Mondek, Matthew H.; Hervat, John C.; and Whipple, Roger B., 4,940,435, Cl. 440-89.000.

Whirlpool Corporation: *See*—
Westergren, George A., 4,940,415, Cl. 439-192.000.

Whitcomb, Carl E.; and Stephens, Harold D. Method and container for growing transplantable plants. 4,939,865, Cl. 47-77.000.

White Consolidated Industries, Inc.: *See*—
Jackson, James R.; and Friskney, Stephen H., 4,940,298, Cl. 312-228.000.
Tuggle, Lloyd H., 4,940,028, Cl. 123-185.00B.

White, Danny R.: *See*—
Claar, Terry D.; Mason, Steven M.; Pochopien, Kevin P.; and White, Danny R., 4,940,679, Cl. 501-96.000.

White, Douglas S., to Elkem a/s. Tiltable ladle with lid. 4,940,215, Cl. 266-275.000.

White, Hollis N., Jr., to White Hydraulics, Inc. Lubrication fluid circulation using a piston valve pump with bi-directional flow. 4,940,401, Cl. 418-61.300.

White Hydraulics, Inc.: *See*—
White, Hollis N., Jr., 4,940,401, Cl. 418-61.300.

Whiteman, Aharon: *See*—
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Whittaker Technical Products, Inc.: *See*—
Dampier, Frederick W.; and Mank, Richard M., 4,940,605, Cl. 427-77.000.

Wickens, Anthony J.: *See*—
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Widemann, Friedrich: *See*—
Riedmaier, Josef; Widemann, Friedrich; and Schmatelka, Bernhard, 4,940,041, Cl. 126-110.00R.

Wiezer, Hartmut: *See*—
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Wife, Richard L.: *See*—
Van Doorn, Johannes A.; Drent, Eit; Van Leeuwen, Petrus W. N. M.; Meijboom, Nicolaas; Van Oort, Aart B.; and Wife, Richard L., 4,940,683, Cl. 502-162.000.

Wilhelm Hegenscheidt Gesellschaft mbH: *See*—
Wittkopp, Helmut; Kluge, Gerhardt; and Klosterhalfen, Hartwig, 4,939,962, Cl. 82-1.110.

Wilkerson, Ivan E.; and Auxier, Robert W., to Limitorque Corporation. Valve actuator two rotor three position indicator. 4,940,011, Cl. 116-277.000.

Wilkins, John D.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Wille, Marc: *See*—
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Wm. T. Burnett & Co., Inc.: *See*—
Tucker, Richard B. C.; Davis, Jackie L.; and Lewis, Fielding H., Jr., 4,940,243, Cl. 273-326.000.

Wm. Wrigley Jr. Company: *See*—
Chapdelaine, Albert H.; and Yatka, Robert J., 4,940,589, Cl. 426-3.000.

Williams, Charles E.; and Kusher, J. Leon, to Hester Industries, Inc. Marinated meat and poultry products having a glazed coating and method for producing such products. 4,940,590, Cl. 426-92.000.

Williams, Douglas D.: *See*—
Gillett, Richard B., Jr.; and Williams, Douglas D., 4,941,083, Cl. 364-200.000.

Williams, James B., to Apollo Computer, Inc. AC to DC converter with unity power factor. 4,940,929, Cl. 323-222.000.

Williams, James H., to Standard International, Inc. Swivel lug pipe joint connections. 4,940,259, Cl. 285-3.000.

Williams, Michael S.: *See*—
Moss, Thomas H., III; Sargent, Ralph R.; and Williams, Michael S., 4,940,757, Cl. 525-502.000.

Williams, Ronald E., to Tribune Publishing Company. Newspaper vending machine and promotional display apparatus therefor. 4,940,160, Cl. 221-34.000.

Williamson, Geronimo C.: *See*—
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Williston, John P.: *See*—
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Willmsen, Vernon H. Marker assembly for a boat trailer. 4,940,251, Cl. 280-414.100.

Wilmarc, Inc.: *See*—
Sawyer, W. David; and Sawyer, Mark W., 4,940,200, Cl. 248-97.000.

Wilms, Coenraad H.: *See*—
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Wilson, Brown L., to Oil Dynamics, Inc. Submersible pump equalizer with multiple expanding chambers. 4,940,911, Cl. 310-87.000.

Wilson, Kitchener C.: *See*—
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Wilson, Stephen T.: *See*—
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Windeln, Johannes: *See*—
Hilgers, Heinz; Mortbitzer, Rainer; and Windeln, Johannes, 4,940,606, Cl. 427-130.000.

Winebaum, Jacob J.; Rider, Alan J.; and Querry, Lester R., to U.S. News. Preprogrammed autodialer and related process. 4,941,172, Cl. 379-355.000.

Winkler, Ekhard: *See*—
Tschang, Chung-Ji; Dix, Johannes P.; Winkler, Ekhard; Gotsmann, Guenther; Glaser, Klaus; and Fikentscher, Rolf, 4,940,609, Cl. 427-304.000.

Winter, Hermann: *See*—
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Winter, John L.: *See*—
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Wirz, Arno; and Krause, Detlev, to Heidelberger Druckmaschinen AG. Suction-type sheet-separating device for a feeder of a printing press. 4,940,221, Cl. 271-107.000.

Wisconsin Alumni Research Foundation: *See*—
DeLuca, Hector F.; Schnoes, Heinrich K.; and Lau, Wan F., 4,940,700, Cl. 514-167.000.

Witco Corporation: *See*—
Pastorino, Ronald L.; and Bock, Lawrence A., 4,940,732, Cl. 521-69.000.

Wittkopp, Helmut; Kluge, Gerhardt; and Klosterhalfen, Hartwig, to Wilhelm Hegenscheidt Gesellschaft mbH. Method and apparatus for influencing the motion of a movable member. 4,939,962, Cl. 82-1.110.

Wolf, Horst, to Zinser Textilmaschinen GmbH. Funnel for a funnel spinning apparatus on a textile machine. 4,939,894, Cl. 57-115.000.

Wolfe, Richard A.: *See*—
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Wong, Heimen: *See*—
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Wong, Patrick S.-L.: *See*—
Theeuwes, Felix; Wong, Patrick S.-L.; Cortese, Richard; and Eckenhoff, James B., 4,940,465, Cl. 604-892.100.

Wong, Pui K., to Shell Oil Company. Polyalcohol. 4,940,758, Cl. 525-539.000.

Wong, Pui K., to Shell Oil Company. Carbon monoxide/olefin polymerization with diluent comprising aprotic solvent and water. 4,940,774, Cl. 528-392.000.

Wood, James A.; and Mazur, Richard J., to American Standard Inc. Electronic adhesion adaptive wheel slide protection arrangement function. 4,941,099, Cl. 364-426.020.

Wood, Philip S.; and Fell, Peter J., to Rolls-Royce plc. Alloy and methods of use thereof. 4,940,566, Cl. 420-443.000.

Woodland, Dennis: *See*—
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Wright, Floyd H.: *See*—
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Wright, Robin E., to Minnesota Mining and Manufacturing Company. Process for metal fibers. 4,940,596, Cl. 427-47.000.

Wu, Dumin: *See*—
Gu, Hansen; and Wu, Dumin, 4,940,060, Cl. 128-735.000.

Wu, You-Sun: *See*—
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Wulff, William B.: *See*—
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Wyatt, W. Gerald; and Bleke, Jim, to VE Holding Corp. Anti-coring grain treatment system. 4,939,988, Cl. 99-516.000.

Wyeth, Richard W.; Johnson, Michael A.; and Globig, Michael A., to United States of America, Energy. Heterodyne laser instantaneous frequency measurement system. 4,940,331, Cl. 356-349.000.

Xerox Corporation: *See*—
Hecht, David L., 4,940,314, Cl. 350-355.000.
Holmes, Maurice F.; Roller, George J.; and Moore, Steven R., 4,941,023, Cl. 355-319.000.
Lehmbeck, Donald R.; Triplett, Roger L.; and Marks, Kevin E., 4,9-1,057, Cl. 358-443.000.

Yaeger, Ronald J. Variable capacity evaporative humidifier. 4,940,475, Cl. 55-224.000.

Yaeger, Stanley A., Jr.: *See*—
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Yahagi, Yoshimasa: *See*—
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Yajima, Kenichi: *See*—
Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, 4,940,488, Cl. 75-500.000.

Yamada, Masanori, to Canon Kabushiki Kaisha. Image signal processing apparatus. 4,941,188, Cl. 382-50.000.

Yamada, Takehiko: *See*—
Nagata, Tatsuya; Yamada, Takehiko; Hara, Eiichi; and Watanabe, Michihiro, 4,940,888, Cl. 250-208.100.

Yamada, Toshio: *See*—
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Yamada, Tsutomu: *See*—
Maeda, Takuya; Murakami, Keikichi; Yamada, Tsutomu; Kishimoto, Mitsuharu; and Yajima, Kenichi, 4,940,488, Cl. 75-500.000.

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Yamaha Corporation: *See*—
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Yamamoto, Koji: *See*—
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Yamamoto, Mikio: *See*—
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Yamamoto, Noboru: *See*—
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Yamamoto, Osamu: *See*—
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Yamamoto, Saburo: *See*—
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Yamamoto, Tamaki; and Mabe, Atsushi, to Sanden Corporation. Scroll type compressor with variable displacement mechanism. 4,940,395, Cl. 417-310.000.

Yamamoto, Tetsu: *See*—
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Yamamura, Kengo: *See*—
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Yamanishi, Kazuhiko: *See*—
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Yamanouchi Pharmaceutical Co., Ltd.: *See*—
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Yamashita, Yoshiro: *See*—
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Yamazaki, Ken-ichi; Takao, Shoji; and Yamamoto, Koji, to Terumo Kabushiki Kaisha. Low-molecular weight peptide mixture and method of producing same. 4,940,662, Cl. 435-68.100.

Yamazaki, Masayuki; Takado, Yutaka; and Mikami, Takashi, to Tosen Sekiyukagaku K.K. Automobile bumper. 4,940,270, Cl. 293-122.000.

Yamazaki, Mitsuo; and Konisi, Kazuo, to Kabushiki Kaisha Toshiba. Division circuit having an operation loop including an adder and multiplier. 4,941,118, Cl. 364-761.000.

Yamazaki, Takashi: *See*—
Oshima, Kazuyoshi; Yamazaki, Takashi; Kasama, Yasuhiro; Udagawa, Tetsu; and Kotani, Hiroaki, 4,941,129, Cl. 365-230.030.

Yang, Yung-Chin, to B.F. Goodrich Company, The. Process for making film grade PVC. 4,940,759, Cl. 526-62.000.

Yassky, John J.; Hahn, Patricia W.; and Atwell, William A., to Pillsbury Company, The. Controlling the texture of microwave brownies. 4,940,595, Cl. 426-243.000.

Yasue, Yoshihiko: *See*—
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

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Yasui, Yasuyoshi, to Toyota Jidosha Kabushiki Kaisha. Limited slip differential. 4,939,953, Cl. 475-233.000.

Yasui, Yoshiyuki: *See*—
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Yasukawa, Takeshi; and Onishi, Masayoshi, to Mitsubishi Denki Kabushiki Kaisha. Speed control unit for an automobile. 4,941,098, Cl. 364-426.040.

Yasumoto, Masami; Motoike, Tatsuya; and Sawasa, Toshiyuki, to Sanyo Electric Co., Ltd.; and Tottori Sanyo Electric Co., Ltd. Linear light source. 4,941,072, Cl. 362-249.000.

Yates, Stephen F., to Allied-Signal Inc. Process for removing vinylidene chloride from 1,1-dichloro-1-fluoroethane. 4,940,824, Cl. 570-179.000.

Yates, Stephen F., to Allied-Signal Inc. Process for removing dichloroacetylene from 1,1-dichloro-1-fluoroethane and/or vinylidene chloride. 4,940,825, Cl. 570-179.000.

Yatka, Robert J.: *See*—
Chapdelaine, Albert H.; and Yatka, Robert J., 4,940,589, Cl. 426-3.000.

Yatsu, Tadao; and Hinooka, Nobuya, to Mitsui Petrochemical Industries. Multilayered container and method for making. 4,940,616, Cl. 428-35.700.

Yazaki Corporation: *See*—
Hyogo, Yukihiro; and Kurihara, Akio, 4,940,417, Cl. 439-248.000.
Kurita, Kaoru; and Nishio, Yukio, 4,940,419, Cl. 439-271.000.

Yeh, Phil C.: *See*—
Matyas, Stephen M.; Abraham, Dennis G.; Johnson, Donald B.; Karne, Ramesh K.; Le, An V.; Prymak, Rostislaw; Thomas, Julian; Wilkins, John D.; and Yeh, Phil C., 4,941,176, Cl. 380-21.000.

Yoakim, Christiane: *See*—
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Yokelson, Howard B.; Partenheimer, Walter; and Gipe, Robert, to Amoco Corporation. Process for producing silicon-containing aromatic polyacids. 4,940,810, Cl. 556-438.000.

Yokogawa Medical Systems, Ltd.: *See*—
Satta, Yusuke; and Takiura, Yasuro, 4,941,094, Cl. 364-413.210.

Yokosouchi, Teruo; Karasawa, Takumi; and Oono, Katuhisa, to Hitachi, Ltd. Method of and apparatus for manufacturing Braun tubes. 4,940,439, Cl. 445-5.000.

Yokoyama, Hitoshi; Sano, Hiroyuki; Horimoto, Akiko; and Kizaki, Masatoshi, to Fuji Oil Company, Limited. Process for producing dried cheese. 4,940,600, Cl. 426-582.000.

Yomura, Yoshinori: *See*—
Adaniya, Takeshi; Yomura, Yoshinori; Ooniwa, Naoyuki; Yasue, Yoshihiko; Kagechika, Hiroshi; Mishima, Tadahiko; and Ishikawa, Hiroshi, 4,940,638, Cl. 428-648.000.
Kagechika, Hiroshi; Mishima, Tadahiko; Yomura, Yoshinori; Ishikawa, Hiroshi; Oniwa, Naoyuki; and Yasue, Yoshihiko, 4,940,522, Cl. 204-192.100.

Yoneda, Hirokazu: *See*—
Toyoshima, Hiromitsu; Yoneda, Hirokazu; Ueno, Hiroshi; and Hatabu, Shoji, 4,939,947, Cl. 74-422.000.

Yoon, Jin H., to Goldstar Co., Ltd. Video signal compensating circuit of a TV/VCR. 4,941,047, Cl. 358-181.000.

Yoshida, fumikazu: *See*—
Shizuki, Tatsuhiko; Bao, Kaoru; Yoshida, fumikazu; and Ohguchi, Masakatsu, 4,940,560, Cl. 264-211.000.
Yoshida, Makoto, to Konica Corporation. Method for slow synchro-flash photography. 4,941,009, Cl. 354-402.000.
Yoshida, Norio, to Ichikoh Industries, Ltd. Drive unit for electrically driven remote-controlled mirror. 4,940,321, Cl. 350-633.000.
Yoshida, Toshihiko; Takiguchi, Haruhisa; Kaneiwa, Shinji; and Kudo, Hiroaki, to Sharp Kabushiki Kaisha. Semiconductor laser element with a single longitudinal oscillation mode. 4,941,148, Cl. 372-96.000.
Yoshida, Tsuyoshi: *See*—
Adachi, Yoshiharu; Kuwana, Kazutaka; and Yoshida, Tsuyoshi, 4,940,295, Cl. 303-117.000.
Yoshihara, Toru; Kawase, Jiro; and Fukuyama, Yukihiro, to Kao Corporation. Hair preparation. 4,940,578, Cl. 424-70.000.
Yoshikami, Shuko: *See*—
Hagins, William A.; and Yoshikami, Shuko, 4,940,896, Cl. 250-338.300.
Yoshikawa, Masaaki: *See*—
Sato, Yasuo; Saito, Tsunehiro; Kamioka, Toshihito; Yoshikawa, Yukio; and Yoshikawa, Masaaki, 4,940,479, Cl. 65-99.200.
Yoshinaga, Katsuichi: *See*—
Ishii, Shigetaka; Ohgawara, Toshifumi; Kobayashi, Shozo; Oiyama, Iwao; and Yoshinaga, Katsuichi, 4,940,836, Cl. 800-220.000.
Yoshioka, Koichi, to Mitsubishi Denki Kabushiki Kaisha. Magnetic head positioning mechanism for magnetic disk device. 4,941,062, Cl. 360-106.000.
Yoshikawa, Yukio: *See*—
Sato, Yasuo; Saito, Tsunehiro; Kamioka, Toshihito; Yoshikawa, Yukio; and Yoshikawa, Masaaki, 4,940,479, Cl. 65-99.200.
Young, Grant A.: *See*—
Fisher, William F.; and Young, Grant A., 4,940,535, Cl. 209-250.000.
Young, John N., to Pacific Products. Electronic casting brake. 4,940,194, Cl. 242-288.000.
Yu, Sypyng B.: *See*—
Thome, John R.; and Yu, Sypyng B., 4,939,942, Cl. 73-865.900.
Yuen, Stanley M., to General Electric Company. Multiple channel adaptive correlation/decorrelation processor. 4,941,117, Cl. 364-724.070.
Yuzyk, Jerome: *See*—
Schuller, Paul D.; Hatcher, David C.; Caelli, Terrance M.; Eggert, Frank M.; and Yuzyk, Jerome, 4,941,164, Cl. 378-205.000.
Zacharias, Donald. Tree limb folding and tying apparatus. 4,939,989, Cl. 100-13.000.
Zambon Group S.p.A.: *See*—
Bertolini, Giorgio; Casagrande, Cesare; and Santangelo, Francesco, 4,940,800, Cl. 548-327.000.
Zancho, William F.: *See*—
Cannalte, Gary A.; Smith, Todd; Zancho, William F.; and Crawford, Robert J., 4,941,167, Cl. 379-67.000.
Zanichelli, Giuseppe, to Zanichelli Meccanica S.P.A. Process for the rapid rehydration of legumes and the like. 4,940,598, Cl. 426-507.000.
Zanichelli Meccanica S.P.A.: *See*—
Zanichelli, Giuseppe, 4,940,598, Cl. 426-507.000.
Zanxx, Inc.: *See*—
Forish, John A.; and Rogers, John J., 4,940,422, Cl. 439-356.000.
Zavracky, Paul M., to Kopin Corporation. Method of making monolithic integrated III-V type laser devices and silicon devices on silicon. 4,940,672, Cl. 437-132.000.
Zech, Hendrik: *See*—
Forsmann, Bernd; Hepp, Wolfgang; Heine, Geroid; Sell, Gustav; and Zech, Hendrik, 4,940,050, Cl. 128-24.00A.
Zeise, Eric K.: *See*—
Pham, Hieu T.; Ng, Yee S.; Kieffer, Kenneth D.; Tschang, Pin S.; and Zeise, Eric K., 4,941,004, Cl. 346-160.000.
Zeller, Claude; Mayeski, Henry A.; and Murphy, Charles F., III, to Pitney Bowes, Inc. Reversible resistant device. 4,940,959, Cl. 338-13.000.
Zenith Electronics Corporation: *See*—
Citta, Richard W., 4,941,049, Cl. 358-187.000.
Danenberg, Bernard; and Flori, Luigi, 4,941,069, Cl. 361-419.000.
Diaz, Bonifacio, 4,941,076, Cl. 363-49.000.
Hartson, Ted E.; and Kelly, Gordon E., 4,941,048, Cl. 358-181.000.
Mycynek, Victor G., 4,940,978, Cl. 341-150.000.
Zhao, Bing Y.: *See*—
Liu, Xin X.; Zhao, Bing Y.; Riegel, Herbert; and Chien, Jo-Lung, 4,940,687, Cl. 502-333.000.
Ziegler, Carl B., Jr.: *See*—
Sum, Phaik-Eng; Joseph, Joseph P.; Ziegler, Carl B., Jr.; Moran, Daniel B.; and Lin, Yang-I, 4,940,710, Cl. 514-254.000.
Ziegler, Peter: *See*—
Hosel, Michael; Finke, Manfred; Walz, Gerd; and Ziegler, Peter, 4,940,768, Cl. 528-45.000.
Zielinski, Erich, to Rheinmetall GmbH. Tank turret magazine system with a primary magazine and an additional magazine. 4,939,980, Cl. 89-46.000.
Ziemann, Heinz: *See*—
Kiel, Wolfgang; and Ziemann, Heinz, 4,940,819, Cl. 568-318.000.
Zimmer, Johannes. Apparatus for coating fabric webs. 4,940,013, Cl. 118-62.000.
Zimmerman, Richard J.; Barnett, Phillip R.; and Suter, Larry, to Nordson Corporation. Mold coating apparatus with air flow control numbers. 4,940,012, Cl. 118-301.000.
Zimmermann, Horst: *See*—
Fischer, Rolf; Gosch, Hans-Juergen; Harder, Wolfgang; Malsch, Klaus-Dieter; Eggersdorfer, Manfred; Franz, Lothar; Zimmermann, Horst; Brenner, Karl; Halbritter, Klaus; Sauer, Wolfgang; and Scheiper, Hans-Juergen, 4,940,805, Cl. 549-326.000.
Zimmermann, Rudolf: *See*—
Behrens, Dietmar; Hoog, Waldemar; and Zimmermann, Rudolf, 4,940,142, Cl. 206-444.000.
Zinnen, Hermann A., to UOP. Chromatographic separation process for recovering individual diethyltoluene isomers. 4,940,548, Cl. 210-656.000.
Zinnen, Hermann A.; and Fergin, Richard L., to UOP. Rejective separation of para-xylene from xylene isomers and ethylbenzene with zeolites. 4,940,830, Cl. 585-828.000.
Zinser Textilmaschinen GmbH: *See*—
Wolf, Horst, 4,939,894, Cl. 57-115.000.
Zuffada, Maurizio; and Sacchi, Fabrizio, to SGS-Thomson Microelectronics s.r.l. Generating a stop signal of an automatic search procedure for a broadcasting station using an available AFC signal. 4,941,204, Cl. 455-164.000.
Zurawski, John H., to Digital Equipment Corporation. Apparatus for high performance multiplication. 4,941,121, Cl. 364-757.000.
ZWN Zahnradwerk Neuenstein GmbH: *See*—
Gramberger, Johann, 4,940,847, Cl. 156-89.000.
Zysman, Alexandre; and Sebag, Henri, to Societe Anonyme dite:L'Oreal. 4-hydroxyisoxazole derivatives, method of preparing same, and cosmetic and pharmaceutical compositions containing them. 4,940,575, Cl. 424-59.000.
501 Standard Elektrik Lorenz AG: *See*—
Kleiber, Herbert, 4,940,984, Cl. 342-173.000.

LIST OF REISSUE PATENTEES

TO WHOM

PATENTS WERE ISSUED ON THE 10TH DAY OF JULY, 1990

NOTE.—Arranged in accordance with the first significant character or word of the name (in accordance with city and telephone directory practice).

Airhart, Tom P., to Atlantic Richfield Company. Mounting and control means for full waveform seismic source. Re. 33,257, Cl. 181-113.000.

Arakawa, Mitsuaki: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; Arakawa, Mitsuaki; and Singer, Jerome R., Re. 33,259, Cl. 324-309.000.

Atlantic Richfield Company: *See*—
Airhart, Tom P., Re. 33,257, Cl. 181-113.000.

Baglee, David A.; and Parker, Ronald, to Texas Instruments, Incorporated. Trench capacitor for high density dynamic RAM. Re. 33,261, Cl. 357-23.600.

Brandstetter, Robert W. Bridge type coordinate measuring machine. Re. 33,254, Cl. 33-503.000.

Busby, Robert B., to Pawling Corporation. Mesh-covered core strip for high frequency RFI/EMI radiation shielding. Re. 33,256, Cl. 174-35.0GC.

Crooks, Lawrence E.; Hoenninger, John C., III; Arakawa, Mitsuaki; and Singer, Jerome R., to University of California, The Regents of the. Method and apparatus for rapid NMR imaging of nuclear parameters with an object. Re. 33,259, Cl. 324-309.000.

Eastman Kodak Company: *See*—
Stephenson, Stanley W., Re. 33,260, Cl. 346-76.0PH.

Ginsburg, Leonard: *See*—
Onik, Gary; and Ginsburg, Leonard, Re. 33,258, Cl. 604-22.000.

Haukaas, Duane C. Rod weeder attachment for an agricultural implement. Re. 33,255, Cl. 172-44.000.

Hoenninger, John C., III: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; Arakawa, Mitsuaki; and Singer, Jerome R., Re. 33,259, Cl. 324-309.000.

Onik, Gary; and Ginsburg, Leonard, to Surgical Dynamics Inc. Irrigating, cutting and aspirating system for percutaneous surgery. Re. 33,258, Cl. 604-22.000.

Parker, Ronald: *See*—
Baglee, David A.; and Parker, Ronald, Re. 33,261, Cl. 357-23.600.

Pawling Corporation: *See*—
Busby, Robert B., Re. 33,256, Cl. 174-35.0GC.

Singer, Jerome R.: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; Arakawa, Mitsuaki; and Singer, Jerome R., Re. 33,259, Cl. 324-309.000.

Stephenson, Stanley W., to Eastman Kodak Company. Thermal printer color dye frame identification using red and yellow light sources. Re. 33,260, Cl. 346-76.0PH.

Surgical Dynamics Inc.: *See*—
Onik, Gary; and Ginsburg, Leonard, Re. 33,258, Cl. 604-22.000.

Texas Instruments, Incorporated: *See*—
Baglee, David A.; and Parker, Ronald, Re. 33,261, Cl. 357-23.600.

University of California, The Regents of the: *See*—
Crooks, Lawrence E.; Hoenninger, John C., III; Arakawa, Mitsuaki; and Singer, Jerome R., Re. 33,259, Cl. 324-309.000.

LIST OF REEXAMINATION PATENTEES

TO WHOM

CERTIFICATES WERE ISSUED

Baer, Thomas M.; and Keirstead, Mark S., to Spectra-Physics Inc.
Laser diode pumped solid state laser. B1 4,701,929, 7-10-90, Cl. 372-71.000.

Keirstead, Mark S.: *See*—
Baer, Thomas M.; and Keirstead, Mark S., B1 4,701,929, Cl. 372-71.000.

Spectra-Physics Inc: *See*—
Baer, Thomas M.; and Keirstead, Mark S., B1 4,701,929, Cl. 372-71.000.

LIST OF DESIGN PATENTEES

Adachi, Koushirou: *See*—
Yoshida, Atsuo; Adachi, Koushirou; Hattori, Tousaku; Watanabe, Hiroshi; and Takahashi, Yoshiaki, 309,130, Cl. D14-102.000.

Agrob AG: *See*—
Colani, Luigi, 309,192, Cl. D25-138.000.

Allen, David O., to Allen Tool Company, Inc. Combined lid and seal for containers. 309,109, 7-10-90, Cl. D9-436.000.

Allen Tool Company, Inc.: *See*—
Allen, David O., 309,109, Cl. D9-436.000.

Alliance Research Corporation: *See*—
Cooper, Gershon N., 309,141, Cl. D14-230.000.

Allibert S.A.: *See*—
Hubert, Manfeld, 309,064, Cl. D6-375.000.

Allstar Verbrauchsguter GmbH: *See*—
Schuster, Wilhelm, 309,205, Cl. D32-32.000.

Alsup, Richard E. Taco shell holder. 309,084, 7-10-90, Cl. D7-504.000.

Amway Corporation: *See*—
Goodrich, Gordon W., 309,203, Cl. D32-22.000.

Antonucci, Daniel M., to Antonucci, Daniel M.; and Celko, David A. Model airplane. 309,164, 7-10-90, Cl. D21-89.000.

Archambault, Alan A.; Palumbo, Nicholas R.; and Fletcher, Lyn C., to General Electric Company. Light diffuser. 309,194, 7-10-90, Cl. D26-125.000.

Arrias, Frank. Automatic tampon dispenser. 309,067, 7-10-90, Cl. D6-515.000.

Associated Mills Inc.: *See*—
Geneve, Francois; and Heiligenstein, Luc, 309,187, Cl. D24-38.000.

Austin, Donald P.; Lawrence, Albert L.; Prewitt, Arthur C.; and Sacherman, James E., to Gilbarco Inc. Gasoline dispensing unit or similar article. 309,144, 7-10-90, Cl. D15-9.200.

Azpeitia Ortiz de Arri, Juan M., to Solac Telecom, S.A. Telephone set with handset telephone and stand therefor having keyboard and speakerphone. 309,138, 7-10-90, Cl. D14-151.000.

Bay Ridge Distributing, Inc.: *See*—
Yockey, Robert E.; and Yockey, John F., 309,115, Cl. D10-56.000.

Beard, Jay T. Guitar. 309,151, 7-10-90, Cl. D17-18.000.

Beatrice/Hunt-Wesson, Inc.: *See*—
Maginnis, William S., Jr., 309,103, Cl. D9-404.000.

Beaver, Ted L., to Quaker State Corporation. Container body for liquids and the like. 309,100, 7-10-90, Cl. D9-375.000.

Benoit-Pequignet, Emile M. F.; and Viennet, Jean-Pierre L., to Montres Emile Pequignet. Wristwatch. 309,114, 7-10-90, Cl. D10-33.000.

Biemolt, Harry P., to Hotpack Corporation. Environmental chamber for controlled plant growth. 309,122, 7-10-90, Cl. D11-145.000.

Bisch, Jeff. Sports goal. 309,170, 7-10-90, Cl. D21-201.000.

Black & Decker Inc.: *See*—
Hattle, Sally A.; and Rawson, Paul, 309,082, Cl. D7-384.000.

Bledsoe, M. Michael. Automobile seat tray. 309,059, 7-10-90, Cl. D3-40.000.

Bluwat AG: *See*—
Ziegler, Rolf, 309,112, Cl. D10-6.000.

Bob Shattan Associates, Inc.: *See—*
Shattan, Herbert B., 309,158, Cl. D19-89.000.

Boda Nova International AB: *See—*
Hanses, Ulf, 309,076, Cl. D7-316.000.

Bonko, Mark L.; and Lopp, Loran C., Jr., to Goodyear Tire & Rubber Company, The. Tire. 309,125, 7-10-90, Cl. D12-151.000.

Bowlin, Colleen M., to ErgoMed, Inc. Block for supporting the head of an injured individual. 309,189, 7-10-90, Cl. D24-64.000.

Braun Aktiengesellschaft: *See—*
Kahlcke, Hartwig, 309,083, Cl. D7-665.000.

Brooks, Richard E. Snow sled. 309,123, 7-10-90, Cl. D12-11.000.

Brown, Nancy A.: *See—*
Hargrove, John W., 309,186, Cl. D24-38.000.

Buchholz, John F., to Ciba Corning Diagnostics Corp. Bottle or the like. 309,080, 7-10-90, Cl. D9-375.000.

Burns, William H., Sr. Inflatable orthopedic pillow. 309,070, 7-10-90, Cl. D6-604.000.

Cajigas, Ralph. Trash container. 309,208, 7-10-90, Cl. D34-4.000.

Cal-Surgical, Inc.: *See—*
Sanderson, Ronald A.; Wilson, John L.; and Maples, Nolan, 309,184, Cl. D24-1.100.

Canon Kabushiki Kaisha: *See—*
McMahon, Franklin, 309,200, Cl. D30-118.000.

Carnevale, Francesco L., to Sunbeam Corporation. Scale base. 309,117, 7-10-90, Cl. D10-94.000.

Carr, Jeff A. Bracket for supporting mounting bar on vehicle. 309,126, 7-10-90, Cl. D12-157.000.

Cashman, James L., III: *See—*
Chakrabarti, Kirti B.; Garrity, Donald F., Jr.; and Cashman, James L., III, 309,193, Cl. D26-2.000.

Cazes, Michel, to Societe Generale des Eaux Minerales de Vittel. Flexible container. 309,099, 7-10-90, Cl. D9-373.000.

Celko, David A.: *See—*
Antonucci, Daniel M., 309,164, Cl. D21-89.000.

Chakrabarti, Kirti B.; Garrity, Donald F., Jr.; and Cashman, James L., III, to GTE Products Corporation. Lamp. 309,193, 7-10-90, Cl. D26-2.000.

Choi, Suk J., to Goldstar Co., Ltd. Air conditioner. 309,179, 7-10-90, Cl. D23-353.000.

Ciba Corning Diagnostics Corp.: *See—*
Buchholz, John F., 309,080, Cl. D9-375.000.

Clover Manufacturing Co., Ltd.: *See—*
Kuwabara, Junichi, 309,156, Cl. D19-41.000.

Code 10 Corporation: *See—*
Holley, Edwin S., 309,095, Cl. D8-356.000.

Colasi, Luigi, to Agrob AG. Tile. 309,192, 7-10-90, Cl. D25-138.000.

Collister, Kenneth D., to Miles Inc. Font of type. 309,154, 7-10-90, Cl. D18-27.000.

Connector Manufacturing Company: *See—*
Ottmann, David M., 309,129, Cl. D13-149.000.

Cooper, Gershon N., to Alliance Research Corporation. Communications antenna. 309,141, 7-10-90, Cl. D14-230.000.

Cosmar Corporation: *See—*
LaJoie, Aldran H., 309,196, Cl. D28-56.000.

David, Thomas J.: *See—*
Foran, Kenneth C.; and David, Thomas J., 309,066, Cl. D6-466.000.

Deanco Investment Company, Ltd.: *See—*
Oliemans, Arie G.; and Visser, Johan H., 309,209, Cl. D34-9.000.

Dege, Howard C.; and Gilmore, Paul R., to Du Pont de Nemours, E. I., and Company. Cargo box door safety chain. 309,092, 7-10-90, Cl. D8-331.000.

DeRosa, Brenda K. Stadium cushion or the like. 309,069, 7-10-90, Cl. D6-601.000.

Dodge & Associates, Ltd.: *See—*
Dodge, Jerry L., 309,096, Cl. D9-337.000.

Dodge, Jerry L., to Dodge & Associates, Ltd. Combined automotive parts and fluid container. 309,096, 7-10-90, Cl. D9-337.000.

Donis, Raymond N.; and Wilcher, Stephen B., to FMC Corporation. Shaft alignment collar. 309,094, 7-10-90, Cl. D8-354.000.

Du Pont de Nemours, E. I., and Company: *See—*
Dege, Howard C.; and Gilmore, Paul R., 309,092, Cl. D8-331.000.

Edwards, Peter R.: *See—*
Muller, Peter H.; Lowe, Peter E.; and Edwards, Peter R., 309,132, Cl. D14-107.000.

ErgoMed, Inc.: *See—*
Bowlin, Colleen M., 309,189, Cl. D24-64.000.

Ertz, Paula, to Smith & Nephew Rolyan, Inc. Combined writing instrument holder and hand support. 309,157, 7-10-90, Cl. D19-55.000.

Fisher, Robert E. C.; Pantelleria, Joseph A.; and Sheehan, Timothy K. Sandwich package. 309,105, 7-10-90, Cl. D9-425.000.

Fletcher, Lyn C.: *See—*
Archambault, Alan A.; Palumbo, Nicholas R.; and Fletcher, Lyn C., 309,194, Cl. D26-125.000.

FMC Corporation: *See—*
Donis, Raymond N.; and Wilcher, Stephen B., 309,094, Cl. D8-354.000.

Foran, Kenneth C.; and David, Thomas J., to Rubbermaid Incorporated. Magazine holder. 309,066, 7-10-90, Cl. D6-466.000.

Fratelli Guzzini S.p.A.: *See—*
Rossari, Ambrogio, 309,075, Cl. D7-641.000.

Fujii, Yoshito: *See—*
Kurozumi, Shigeru; Fujii, Yoshito; and Sakamoto, Harumi, 309,134, Cl. D14-126.000.

Furusawa, Masahiro. Air pump. 309,174, 7-10-90, Cl. D23-231.000.

Gardere, Colette M., to Societe Civile due Vignoble de Chateau Latour. Decanter. 309,101, 7-10-90, Cl. D9-385.000.

Garrity, Donald F., Jr.: *See—*
Chakrabarti, Kirti B.; Garrity, Donald F., Jr.; and Cashman, James L., III, 309,193, Cl. D26-2.000.

General Electric Company: *See—*
Archambault, Alan A.; Palumbo, Nicholas R.; and Fletcher, Lyn C., 309,194, Cl. D26-125.000.

Genesco Inc.: *See—*
Whatley, Ian H., 309,055, Cl. D2-314.000.

Geneve, Francois; and Heiligenstein, Luc, to Associated Mills Inc. Bubbling bath back pad. 309,187, 7-10-90, Cl. D24-38.000.

Gilbarco Inc.: *See—*
Austin, Donald P.; Lawrence, Albert L.; Prewitt, Arthur C.; and Sacherman, James E., 309,144, Cl. D15-9.200.

Gilmore, Paul R.: *See—*
Dege, Howard C.; and Gilmore, Paul R., 309,092, Cl. D8-331.000.

Gisser, Marshall, to New York Design Studio, Incorporated. Telephone set or similar article. 309,137, 7-10-90, Cl. D14-151.000.

Glaxo Group Limited: *See—*
Price, Philip T., 309,097, Cl. D9-341.000.

Gold Star Co., Ltd.: *See—*
Jo, Jae S., 309,133, Cl. D14-126.000.

Goldberg, Alan E., to Mobil Oil Corporation. Service building and the like. 309,190, 7-10-90, Cl. D25-34.000.

Goldberg, Alan E., to Mobil Oil Corporation. Service building and the like. 309,191, 7-10-90, Cl. D25-34.000.

Goldstar Co., Ltd.: *See—*
Choi, Suk J., 309,179, Cl. D23-353.000.

Golkar, Homayun. Beverage container holder. 309,072, 7-10-90, Cl. D7-622.000.

Goodrich, Gordon W., to Amway Corporation. Vacuum cleaner. 309,203, 7-10-90, Cl. D32-22.000.

Goodyear Tire & Rubber Company, The: *See—*
Bonko, Mark L.; and Lopp, Loran C., Jr., 309,125, Cl. D12-151.000.

Gorton, Lanny A., to Pacesetter Infusion, Ltd. Medication infusion cassette. 309,188, 7-10-90, Cl. D24-51.000.

Great Plains Industries, Inc.: *See—*
Hall, Robert E., 309,118, Cl. D10-96.000.

Greufe, David A. Eyewear. 309,148, 7-10-90, Cl. D16-102.000.

Griffin, John, to Weslo, Inc. Exercise cycle. 309,167, 7-10-90, Cl. D21-194.000.

GTE Products Corporation: *See—*
Chakrabarti, Kirti B.; Garrity, Donald F., Jr.; and Cashman, James L., III, 309,193, Cl. D26-2.000.

Hall, Robert E., to Great Plains Industries, Inc. Flow meter. 309,118, 7-10-90, Cl. D10-96.000.

Hanses, Ulf, to Boda Nova International AB. Thermal beverage server. 309,076, 7-10-90, Cl. D7-316.000.

Hargrove, John W., to Brown, Nancy A. Dual-chambered hydro tub Spa. 309,186, 7-10-90, Cl. D24-38.000.

Hastings, Malcolm; and Lang, John, to Hozelock-ASL Limited. Water control valve. 309,175, 7-10-90, Cl. D23-245.000.

Hattle, Sally A.; and Rawson, Paul, to Black & Decker Inc. Food processor. 309,082, 7-10-90, Cl. D7-384.000.

Hattori, Tousaku: *See—*
Yoshida, Atsuo; Adachi, Koushirou; Hattori, Tousaku; Watanabe, Hiroshi; and Takahashi, Yoshiaki, 309,130, Cl. D14-102.000.

Hayes Microcomputer Products, Inc.: *See—*
Muller, Peter H.; Lowe, Peter E.; and Edwards, Peter R., 309,132, Cl. D14-107.000.

Haythornthwaite, Peter, to van Urk, Frederick Daniel; and van Urk, Fredrikus Hermannus. Condiment dispenser. 309,071, 7-10-90, Cl. D7-600.000.

Heiligenstein, Luc: *See—*
Geneve, Francois; and Heiligenstein, Luc, 309,187, Cl. D24-38.000.

Hickmott, Robert C., to John Henry Company, The. Plant tag. 309,159, 7-10-90, Cl. D20-26.000.

Hing, Ally O. Index card. 309,155, 7-10-90, Cl. D19-1.000.

Hiraishi, Etsuo; and Numata, Teruhisa, to Ryobi Ltd. Fishing reel. 309,171, 7-10-90, Cl. D22-141.000.

Hiraishi, Etuo; and Numata, Teruhisa, to Ryobi Ltd. Fishing reel. 309,172, 7-10-90, Cl. D22-141.000.

Hitachi Koki Co., Ltd.: *See—*
Ogawa, Yasunori; and Yamamoto, Kunio, 309,088, Cl. D8-68.000.

Hitachi, Ltd.: *See—*
Yoshida, Atsuo; Adachi, Koushirou; Hattori, Tousaku; Watanabe, Hiroshi; and Takahashi, Yoshiaki, 309,130, Cl. D14-102.000.

Holland, Eddie L., to Phillips & Brooks, Inc. Advertising frame for pay telephone. 309,160, 7-10-90, Cl. D20-41.000.

Holley, Edwin S., to Code 10 Corporation. Ground anchor for a soaker hose. 309,095, 7-10-90, Cl. D8-356.000.

Honda Giken Kogyo Kabushiki Kaisha: *See—*
Walker, Lloyd; Matsuzawa, Masakazu; and Manchester, Martin, 309,128, Cl. D12-316.000.
Yamada, Toshiyuki; Kitagawa, Makoto; and Kurihara, Toshio, 309,127, Cl. D12-158.000.

Honda, Youji, to Sanyo Electric Co., Ltd. Tape player. 309,140, 7-10-90, Cl. D14-165.000.

Horie, Hideyuki, to Kabushiki Kaisha Toshiba. Optical character reader for electronic computers. 309,131, 7-10-90, Cl. D14-107.000.

Hotpack Corporation: *See—*
Biemolt, Harry P., 309,122, Cl. D11-145.000.

Hozelock-ASL Limited: *See—*
Hastings, Malcolm; and Lang, John, 309,175, Cl. D23-245.000.

Hsu, Chin-Tien. Pocket fan or similar article. 309,182, 7-10-90, Cl. D23-382.000.

Hubert, Manfeld, to Allibert S.A. Arm chair. 309,064, 7-10-90, Cl. D6-375.000.

Huff, Atwood J. Adjustable table for attachment to an automobile tailgate. 309,065, 7-10-90, Cl. D6-429.000.

Ikuzawa, Yoko: *See*—
Sakaguchi, Hiroshi; and Ikuzawa, Yoko, 309,152, Cl. D18-7.000.

Incendex Inc.: *See*—
Macramalla, Esmat, 309,198, Cl. D29-5.000.

International Consumer Brands, Inc.: *See*—
Petrie, Aidan; and Lane, Stephen, 309,079, Cl. D7-379.000.

Ishida, Kazuo, to Maruan Co., Ltd. Toy motor car. 309,166, 7-10-90, Cl. D21-136.000.

Iwama, Takeshi, to Sony Corporation. Combined video tape recorder and television receiver. 309,135, 7-10-90, Cl. D14-129.000.

Jo, Jae S., to Gold Star Co., Ltd. Television receiver. 309,133, 7-10-90, Cl. D14-126.000.

John Henry Company, The: *See*—
Hicknott, Robert C., 309,159, Cl. D20-26.000.

John Manufacturing Limited: *See*—
Yuen, John S., 309,202, Cl. D32-18.000.

Johnny Stewart Game Calls, Inc.: *See*—
Stewart, Johnny E., 309,120, Cl. D10-116.000.
Stewart, Johnny E., 309,121, Cl. D10-116.000.

Jones, Howard E. Game board. 309,163, 7-10-90, Cl. D21-31.000.

Jordan, Alan: *See*—
Jordan, Cindy; and Jordan, Alan, 309,068, Cl. D6-601.000.

Jordan, Cindy; and Jordan, Alan. Baby support pillow. 309,068, 7-10-90, Cl. D6-601.000.

Joseffy, David E. Alarm sensor for the undercarriage of automobiles. 309,111, 7-10-90, Cl. D10-117.000.

Joyce, Lawrence J.: *See*—
Lockawich, Stephen J., 309,185, Cl. D24-10.000.

Kabushiki Kaisha Toshiba: *See*—
Horie, Hideyuki, 309,131, Cl. D14-107.000.

Kahlcke, Hartwig, to Braun Aktiengesellschaft. Juice extractor. 309,083, 7-10-90, Cl. D7-665.000.

Kalman, Jeffrey M.: *See*—
Sovis, John F.; Kopco, James J.; Kalman, Jeffrey M.; and Saunders, Craig M., 309,204, Cl. D32-22.000.

Kaplan, Andrew J.; and Spinale, Charles E., to Kinderworks Corporation. Children's toy. 309,165, 7-10-90, Cl. D21-106.000.

Kee, Peter M. Y., to Rosalco, Inc. Bench. 309,063, 7-10-90, Cl. D6-349.000.

Kelley, Jeremy J. Scraper for removing frost from windshields or the like. 309,206, 7-10-90, Cl. D32-46.000.

Kelston, Henry J. Squeeze resistant carton holder. 309,074, 7-10-90, Cl. D7-602.000.

Kendall, James: *See*—
Pilolla, Joseph J.; Wilson, John R.; Meier, Steven C.; and Kendall, James, 309,195, Cl. D28-54.100.

Kieninger & Obergfell GmbH & Co.: *See*—
Neininger, Gunter, 309,110, Cl. D10-1.000.

Kinderworks Corporation: *See*—
Kaplan, Andrew J.; and Spinale, Charles E., 309,165, Cl. D21-106.000.

Kitagawa, Makoto: *See*—
Yamada, Toshiyuki; Kitagawa, Makoto; and Kurihara, Toshio, 309,127, Cl. D12-158.000.

Kokubo, Mami, to Sharp Corporation. Microwave oven. 309,078, 7-10-90, Cl. D7-351.000.

Kopco, James J.: *See*—
Sovis, John F.; Kopco, James J.; Kalman, Jeffrey M.; and Saunders, Craig M., 309,204, Cl. D32-22.000.

Kremitzki, Mark L. Receiver for tracking deer hunting arrows. 309,119, 7-10-90, Cl. D10-104.000.

Kronthaler, Peter, to Maier & Co. Fabrik Fuer Spezialmaschinen. Stand for a woodworking machine. 309,147, 7-10-90, Cl. D15-133.000.

Kurihara, Toshio: *See*—
Yamada, Toshiyuki; Kitagawa, Makoto; and Kurihara, Toshio, 309,127, Cl. D12-158.000.

Kurozumi, Shigeru; Fujii, Yoshito; and Sakamoto, Harumi, to Sharp Corporation. Television set. 309,134, 7-10-90, Cl. D14-126.000.

Kuwabara, Junichi, to Clover Manufacturing Co., Ltd. Chalk marker. 309,156, 7-10-90, Cl. D19-41.000.

LaJoie, Aldran H., to Cosmar Corporation. Artificial nail sizing ring. 309,196, 7-10-90, Cl. D28-56.000.

Lane, Stephen: *See*—
Petrie, Aidan; and Lane, Stephen, 309,079, Cl. D7-379.000.

Lang, John: *See*—
Hastings, Malcolm; and Lang, John, 309,175, Cl. D23-245.000.

Lawrence, Albert L.: *See*—
Austin, Donald P.; Lawrence, Albert L.; Prewitt, Arthur C.; and Sacherman, James E., 309,144, Cl. D15-9.200.

Les Produits Associes LPA-Broxo S.A.: *See*—
Moret, Michel A., 309,098, Cl. D9-371.000.

Lesch, Jeri D. Fashion pocket insert. 309,061, 7-10-90, Cl. D3-106.000.

Leung, Donny, to Video Technology Industries, Inc. Electronic game housing. 309,161, 7-10-90, Cl. D21-13.000.

Lockawich, Stephen J., to Stiles, Herbert L.; and Joyce, Lawrence J. Combined cementing tool and vibratory rod for dental applications. 309,185, 7-10-90, Cl. D24-10.000.

Lopp, Loran C., Jr.: *See*—
Bonko, Mark L.; and Lopp, Loran C., Jr., 309,125, Cl. D12-151.000.

Lowder, Charles A., Sr. Storage container for placement atop a toilet tank. 309,178, 7-10-90, Cl. D23-313.000.

Lowe, Peter E.: *See*—
Muller, Peter H.; Lowe, Peter E.; and Edwards, Peter R., 309,132, Cl. D14-107.000.

Macramalla, Esmat, to Incendex Inc. Handle for fire extinguisher. 309,198, 7-10-90, Cl. D29-5.000.

Maginnis, William S., Jr., to Beatrice/Hunt-Wesson, Inc. Bottle. 309,103, 7-10-90, Cl. D9-404.000.

Maier & Co. Fabrik Fuer Spezialmaschinen: *See*—
Kronthaler, Peter, 309,147, Cl. D15-133.000.
Nemetz, Winfried, 309,146, Cl. D15-131.000.

Manchester, Martin: *See*—
Walker, Lloyd; Matsuzawa, Masakazu; and Manchester, Martin, 309,128, Cl. D12-316.000.

Maples, Nolan: *See*—
Sanderson, Ronald A.; Wilson, John L.; and Maples, Nolan, 309,184, Cl. D24-1.100.

Marshall, Ernest H. Combined collapsible cup, compass and altimeter. 309,116, 7-10-90, Cl. D10-62.000.

Marusan Co., Ltd.: *See*—
Ishida, Kazuo, 309,166, Cl. D21-136.000.

Masco Corporation of Indiana: *See*—
Stipe, Roger E., 309,173, Cl. D23-233.000.

Matsuzawa, Masakazu: *See*—
Walker, Lloyd; Matsuzawa, Masakazu; and Manchester, Martin, 309,128, Cl. D12-316.000.

McMahon, Franklin, to Univier International Corporation. Bed for pets. 309,199, 7-10-90, Cl. D30-118.000.

McMahon, Franklin, to Canon Kabushiki Kaisha. Bed for pets. 309,200, 7-10-90, Cl. D30-118.000.

Meier, Steven C.: *See*—
Pilolla, Joseph J.; Wilson, John R.; Meier, Steven C.; and Kendall, James, 309,195, Cl. D28-54.100.

Miles Inc.: *See*—
Collister, Kenneth D., 309,154, Cl. D18-27.000.

Miller, John E., Jr., to Woodmaster Tools, Inc. Stroke sander. 309,145, 7-10-90, Cl. D15-124.000.

Mobil Oil Corporation: *See*—
Goldberg, Alan E., 309,190, Cl. D25-34.000.
Goldberg, Alan E., 309,191, Cl. D25-34.000.

Montres Emile Pequignet: *See*—
Benoit-Pequignet, Emile M. F.; and Viennet, Jean-Pierre L., 309,114, Cl. D10-33.000.

Moret, Michel A., to Les Produits Associes LPA-Broxo S.A. Bottle or similar article. 309,098, 7-10-90, Cl. D9-371.000.

Moritani, Hiroshi, to Sharp Corporation. Air conditioner. 309,180, 7-10-90, Cl. D23-353.000.

Motorola, Inc.: *See*—
Siddoway, Craig F., 309,136, Cl. D14-137.000.

Muller, Peter H.; Lowe, Peter E.; and Edwards, Peter R., to Hayes Microcomputer Products, Inc. Modem or similar article. 309,132, 7-10-90, Cl. D14-107.000.

Neininger, Gunter, to Kieninger & Obergfell GmbH & Co. Anniversary clock case. 309,110, 7-10-90, Cl. D10-1.000.

Nemetz, Winfried, to Maier & Co. Fabrik Fuer Spezialmaschinen. Vertical milling center. 309,146, 7-10-90, Cl. D15-131.000.

New York Design Studio, Incorporated: *See*—
Gisser, Marshall, 309,137, Cl. D14-151.000.

Numata, Teruhisa: *See*—
Hiraishi, Etsuo; and Numata, Teruhisa, 309,171, Cl. D22-141.000.
Hiraishi, Etuso; and Numata, Teruhisa, 309,172, Cl. D22-141.000.

Ogawa, Yasunori; and Yamamoto, Kunio, to Hitachi Koki Co., Ltd. Portable air nailer. 309,088, 7-10-90, Cl. D8-68.000.

Okamoto, Hiromi, to Sanyo Electric Co., Ltd. Digital audio compact disk player. 309,139, 7-10-90, Cl. D14-156.000.

Oliemans, Arie G.; and Visser, Johan H., to Deanco Investment Company, Ltd. Litter bin for use in cars. 309,209, 7-10-90, Cl. D34-9.000.

Olsen, Hans, to Professional Dental Technologies, Inc. Brush head for mounting in a dental instrument. 309,062, 7-10-90, Cl. D4-104.000.

Osemlak, Richard J.: *See*—
Schmidt, John M.; and Osemlak, Richard J., 309,090, Cl. D8-99.000.

Ottmann, David M., to Connector Manufacturing Company. L-shaped electrical connector. 309,129, 7-10-90, Cl. D13-149.000.

Pacesetter Infusion, Ltd.: *See*—
Gorton, Lanny A., 309,188, Cl. D24-51.000.

Palumbo, Nicholas R.: *See*—
Archambault, Alan A.; Palumbo, Nicholas R.; and Fletcher, Lyn C., 309,194, Cl. D26-125.000.

Pantelleria, Joseph A.: *See*—
Fisher, Robert E. C.; Pantelleria, Joseph A.; and Sheehan, Timothy K., 309,105, Cl. D9-425.000.

Parachinni, Charles A. Key retainer. 309,060, 7-10-90, Cl. D3-61.000.

Peters, Gerald A. Embroidery work station. 309,056, 7-10-90, Cl. D3-25.000.

Peters, Gerald A. Embroidery work station. 309,057, 7-10-90, Cl. D3-26.000.

Peters, Gerald A. Embroidery work station. 309,058, 7-10-90, Cl. D3-26.000.

Petrie, Aidan; and Lane, Stephen, to International Consumer Brands, Inc. Hand mixer. 309,079, 7-10-90, Cl. D7-379.000.

Phillips & Brooks, Inc.: *See*—
Holland, Eddie L., 309,160, Cl. D20-41.000.

Pilolla, Joseph J.; Wilson, John R.; Meier, Steven C.; and Kendall, James, to Sloan Valve Company. Hand dryer. 309,195, 7-10-90, Cl. D28-54.100.

Plastics, Inc.: *See*—
Pomroy, James F., 309,077, Cl. D7-318.000.
Pomroy, James F., to Plastics, Inc. Pitcher. 309,077, 7-10-90, Cl. D7-318.000.
Pouilloux, Roger, to Sporoptic Pouilloux S.A. Eyeglass frame. 309,149, 7-10-90, Cl. D16-102.000.
Prewitt, Arthur C.: *See*—
Austin, Donald P.; Lawrence, Albert L.; Prewitt, Arthur C.; and Sacherman, James E., 309,144, Cl. D15-9.200.
Price, Philip T., to Glaxo Group Limited. Package of containers. 309,097, 7-10-90, Cl. D9-341.000.
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Olsen, Hans, 309,062, Cl. D4-104.000.
Quaker State Corporation: *See*—
Beaver, Ted L., 309,100, Cl. D9-375.000.
Rawson, Paul: *See*—
Hattle, Sally A.; and Rawson, Paul, 309,082, Cl. D7-384.000.
Reinholt, Eric K. Combined wall plate and electrical plug safety cap. 309,093, 7-10-90, Cl. D8-353.000.
Robinson, Lloyd A. Drinking can holder. 309,073, 7-10-90, Cl. D7-608.000.
Rosalco, Inc.: *See*—
Kee, Peter M. Y., 309,063, Cl. D6-349.000.
Rossari, Ambrogio, to Fratelli Guzzini S.p.A. Toothpick case. 309,075, 7-10-90, Cl. D7-641.000.
Royal Appliance Manufacturing Co.: *See*—
Sovis, John F.; Kopco, James J.; Kalman, Jeffrey M.; and Saunders, Craig M., 309,204, Cl. D32-22.000.
Rubbermaid Incorporated: *See*—
Foran, Kenneth C.; and David, Thomas J., 309,066, Cl. D6-466.000.
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Ryobi Ltd.: *See*—
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Sacherman, James E.: *See*—
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Saito, Toshiaki: *See*—
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Sakaguchi, Hiroshi; and Ikuzawa, Yoko, to Sharp Corporation. Electronic calculator with printer. 309,152, 7-10-90, Cl. D18-7.000.
Sakamoto, Harumi: *See*—
Kurozumi, Shigeru; Fujii, Yoshito; and Sakamoto, Harumi, 309,134, Cl. D14-126.000.
Sanderson, Ronald A.; Wilson, John L.; and Maples, Nolan, to Cal-Surgical, Inc. Surgical support stand for use in arthroscopic surgery of the shoulder or the like. 309,184, 7-10-90, Cl. D24-1.100.
Sanrio Company, Ltd.: *See*—
Tsuji, Shintaro, 309,089, Cl. D8-82.000.
Sanyo Electric Co., Ltd.: *See*—
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Sovis, John F.; Kopco, James J.; Kalman, Jeffrey M.; and Saunders, Craig M., 309,204, Cl. D32-22.000.
Sawada, Masaji; and Takahashi, Toshiya, to Sharp Corporation. Electronic calculator. 309,153, 7-10-90, Cl. D18-7.000.
Scheurer, Robert S. Swimming pool float. 309,169, 7-10-90, Cl. D21-237.000.
Schmidt, John M.; and Osemlak, Richard J. Handle for pocket blade. 309,090, 7-10-90, Cl. D8-99.000.
Schoepfer, Eddy, to Tag-Heuer S.A. Combined watch case and wristband therefor. 309,113, 7-10-90, Cl. D10-32.000.
Schuster, Wilhelm, to Allstar Verbrauchsguter GmbH. Vacuum cleaner nozzle. 309,205, 7-10-90, Cl. D32-32.000.
Sessions, James R. Combination adult and child toilet seat and cover. 309,176, 7-10-90, Cl. D23-296.000.
Sharp Corporation: *See*—
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Kurozumi, Shigeru; Fujii, Yoshito; and Sakamoto, Harumi, 309,134, Cl. D14-126.000.
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Shattan, Herbert B., to Bob Shattan Associates, Inc. Combined crayon container and coloring strip. 309,158, 7-10-90, Cl. D19-89.000.
Sheehan, Timothy K.: *See*—
Fisher, Robert E. C.; Pantelleria, Joseph A.; and Sheehan, Timothy K., 309,105, Cl. D9-425.000.
Shepard, Lester. Toilet seat handle. 309,091, 7-10-90, Cl. D8-305.000.
Siddoway, Craig F., to Motorola, Inc. Portable two-way radio or similar article. 309,136, 7-10-90, Cl. D14-137.000.
Simon, Ronald F. Radon exhaust vent cap. 309,181, 7-10-90, Cl. D23-371.000.
Sloan Valve Company: *See*—
Pilolla, Joseph J.; Wilson, John R.; Meier, Steven C.; and Kendall, James, 309,195, Cl. D28-54.100.
Smith, John W. Place kicking tee. 309,168, 7-10-90, Cl. D21-209.000.
Smith & Nephew Rolyan, Inc.: *See*—
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Societe Civile due Vignoble de Chateau Latour: *See*—
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Societe Generale des Eaux Minerales de Vittel: *See*—
Cazes, Michel, 309,099, Cl. D9-373.000.
Solac Telecom, S.A.: *See*—
Azpeitia Ortiz de Arri, Juan M., 309,138, Cl. D14-151.000.
Solomon, Roger, to Test-Rite Products Corp. Wood crate. 309,104, 7-10-90, Cl. D9-420.000.
Sony Corporation: *See*—
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Sovis, John F.; Kopco, James J.; Kalman, Jeffrey M.; and Saunders, Craig M., to Royal Appliance Manufacturing Co. Vacuum cleaner. 309,204, 7-10-90, Cl. D32-22.000.
Spin-Cast Plastics, Inc.: *See*—
Willson, Richard L., 309,106, Cl. D9-430.000.
Spinale, Charles E.: *See*—
Kaplan, Andrew J.; and Spinale, Charles E., 309,165, Cl. D21-106.000.
Sporer, James S. Clothespin. 309,207, 7-10-90, Cl. D32-61.000.
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Stewart, Johnny E., to Johnny Stewart Game Calls, Inc. Sound-producing rattling antler for attracting deer and elk. 309,120, 7-10-90, Cl. D10-116.000.
Stewart, Johnny E., to Johnny Stewart Game Calls, Inc. Sound-producing rattling antler for attracting deer and elk. 309,121, 7-10-90, Cl. D10-116.000.
Stiles, Herbert L.: *See*—
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Stipe, Roger E., to Masco Corporation of Indiana. Vacuum breaker. 309,173, 7-10-90, Cl. D23-233.000.
Sunbeam Corporation: *See*—
Carnevale, Francesco L., 309,117, Cl. D10-94.000.
Thomas, Richard K., 309,081, Cl. D7-379.000.
Swalwell, Larry. Lotto pick cards. 309,162, 7-10-90, Cl. D21-37.000.
Swinburne, David A. Support stand for a desk telephone. 309,142, 7-10-90, Cl. D14-251.000.
Tag-Heuer S.A.: *See*—
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Taylor, William N., III. Ceiling fan blade. 309,183, 7-10-90, Cl. D23-413.000.
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Thomas, Richard K., to Sunbeam Corporation. Portable electric food mixer. 309,081, 7-10-90, Cl. D7-379.000.
Thrasher, Derose W. Golf ball washing machine. 309,201, 7-10-90, Cl. D32-1.000.
Tomasello, Salvatore. Liquid applicator. 309,108, 7-10-90, Cl. D9-434.000.
Tsuji, Shintaro, to Sanrio Company, Ltd. Screwdriver. 309,089, 7-10-90, Cl. D8-82.000.
U.S. Philips Corporation: *See*—
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Usbeck, Georg H. Can opener. 309,085, 7-10-90, Cl. D8-33.000.
Van Asten, Jan F., to U.S. Philips Corporation. Can-opener. 309,086, 7-10-90, Cl. D8-36.000.
van Urk, Frederick Daniel: *See*—
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Haythornthwaite, Peter, 309,071, Cl. D7-600.000.
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Walker, Lloyd; Matsuzawa, Masakazu; and Manchester, Martin, to Honda Giken Kogyo Kabushiki Kaisha. Water craft. 309,128, 7-10-90, Cl. D12-316.000.
Watanabe, Hiroshi: *See*—
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Weitzman, Susan C. Child's toilet seat. 309,177, 7-10-90, Cl. D23-311.000.
Wentz, John B. Microscope housing. 309,150, 7-10-90, Cl. D16-131.000.
Weslo, Inc.: *See*—
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Whatley, Ian H., to Genesco Inc. Sport shoe upper. 309,055, 7-10-90, Cl. D2-314.000.
Wilcher, Stephen B.: *See*—
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Wild, Hans-Peter, to Rudolf Wild GmbH & Co. International KG. Bottle. 309,102, 7-10-90, Cl. D9-401.000.
Williams, Joseph K., Jr. Hairstyling projection screen. 309,197, 7-10-90, Cl. D28-99.000.
Willson, Richard L., to Spin-Cast Plastics, Inc. Dock storage box. 309,106, 7-10-90, Cl. D9-430.000.
Wilson, John L.: *See*—
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Wilson, John R.: *See*—
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Winterling, Stig. Blank for package or the like. 309,107, 7-10-90, Cl. D9-433.000.
Woodmaster Tools, Inc.: *See*—
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Yamada, Toshiyuki; Kitagawa, Makoto; and Kurihara, Toshio, to Honda Giken Kogyo Kabushiki Kaisha. Motorcycle rear carrier unit. 309,127, 7-10-90, Cl. D12-158.000.
Yamamoto, Etsushi; and Saito, Toshiaki, to Ryobi Ltd. Electric chain saw. 309,087, 7-10-90, Cl. D8-65.000.
Yamamoto, Kunio: *See*—
Ogawa, Yasunori; and Yamamoto, Kunio, 309,088, Cl. D8-68.000.
Yang, Muh-Chuan, to Yang, Muh-Chuan. Packaged air compressor set. 309,143, 7-10-90, Cl. D15-9.000.
Yockey, John F.: *See*—
Yockey, Robert E.; and Yockey, John F., 309,115, Cl. D10-56.000.
Yockey, Robert E.; and Yockey, John F., to Bay Ridge Distributing, Inc. Humidity sensor. 309,115, 7-10-90, Cl. D10-56.000.
Yoshida, Atsuo; Adachi, Koushirou; Hattori, Tousaku; Watanabe, Hiroshi; and Takahashi, Yoshiaki, to Hitachi, Ltd. Central processor for an electronic computer. 309,130, 7-10-90, Cl. D14-102.000.
Young, David R. Beverage dispensing trailer. 309,124, 7-10-90, Cl. D12-102.000.
Yuen, John S., to John Manufacturing Limited. Rechargeable vacuum cleaner. 309,202, 7-10-90, Cl. D32-18.000.
Ziegler, Rolf, to Bluwat AG. Clock. 309,112, 7-10-90, Cl. D10-6.000.

LIST OF PLANT PATENTEES

Ison, William G. Sweet Jenay. 7,265, 7-10-90, Cl. 47.000.
Ison, William G. Pineapple. 7,266, 7-10-90, Cl. 47.000.
Ison, William G. Supreme. 7,267, 7-10-90, Cl. 47.000.
Ison, William G. Janebell. 7,268, 7-10-90, Cl. 47.000.

University of Minnesota, Regents of the: *See*—
Widmer, Richard E., 7,269, Cl. 82.000.
Weeks, O. L., to Weeks, O. L. Rose plant named 'Verolwek'. 7,264, 7-10-90, Cl. 15.000.
Widmer, Richard E., to University of Minnesota, Regents of the. Chrysanthemum plant named Maroon Pride. 7,269, 7-10-90, Cl. 82.000.

CLASSIFICATION OF PATENTS

ISSUED JULY 10, 1990

NOTE.—First number, class; second number, subclass; third number, patent number

CLASS 2

128 4,939,794

CLASS 4

228 4,939,795
236 4,939,796
490 4,939,797
502 4,939,798
578 4,939,799
620 4,939,800

CLASS 5

37 C 4,939,802
61 4,939,801
414 4,939,803
468 4,939,804

CLASS 8

527 4,940,469

CLASS 12

10.5 4,939,805

CLASS 15

1.7 4,939,806
111 4,939,807
321 4,940,082
322 4,939,808
328 4,939,809
347 4,939,810
385 4,939,811

CLASS 16

110 R 4,939,812

CLASS 17

11 4,939,813
74 4,939,814

CLASS 19

105 4,939,816

CLASS 23

308 S 4,939,817

CLASS 24

16 R 4,939,818
4,939,819
129 R 4,939,820
136 R 4,939,821
271 4,939,822
590 4,939,823
633 4,939,824

CLASS 26

93 4,939,825

CLASS 29

25.35 4,939,826
159.2 4,939,829
173 4,939,830
263 4,939,831
281.4 4,939,832
401 4,939,833
568 4,939,834
603 4,939,835
4,939,836
4,939,837
795 4,939,838
897.2 4,939,828
898.054 4,939,827

CLASS 30

37 4,939,840
125 4,939,839
317 4,939,841
386 4,939,842
388 4,939,843

CLASS 33

12 4,939,844
199 R 4,939,845
404 4,939,846
503 Re.33,254
545 4,939,847
608 4,939,848
811 4,939,849

CLASS 34

10 4,939,850

CLASS 36

3 B 4,939,851
44 4,939,852
103 4,939,853

CLASS 37

94 4,939,854
103 4,939,855

CLASS 38

77.7 4,939,856
77.8 4,939,857

CLASS 40

152.1 4,939,858
406 4,939,859
513 4,939,860
651 4,939,861

CLASS 42

88 4,939,862
103 4,939,863

CLASS 43

17 4,939,864

CLASS 47

77 4,939,865

CLASS 49

55 4,939,866
349 4,939,867
388 4,939,868

CLASS 51

109 BS 4,939,869
135 R 4,939,870
163.2 4,939,871
180 4,939,872
281 R 4,939,873

CLASS 52

4 4,939,874
7 4,939,875
64 4,939,876
155 4,939,877
169.14 4,939,878
208 4,939,879
473 4,939,880
565 4,939,881
648 4,939,882
686 4,939,883

CLASS 53

127 4,939,884
138 A 4,939,885
236 4,939,886
411 4,939,888
450 4,939,889
460 4,939,887
486 4,939,890
496 4,939,891

CLASS 55

2 4,940,470
120 4,940,471
195 4,940,472
205 4,940,473
210 4,940,474
224 4,940,475
486 4,940,476

CLASS 56

11.1 4,939,892

CLASS 57

22 4,939,893
115 4,939,894
263 4,939,895
293 4,939,896
301 4,939,897

CLASS 60

274 4,939,898
412 4,939,899
456 4,939,900
562 4,939,901

CLASS 62

46.2 4,939,902
77 4,939,903
4,939,904
4,939,905
94 4,939,906
95 4,939,907
139 4,939,908
158 4,939,909
160 4,939,910
239 4,939,911
457.1 4,939,912

CLASS 63

21 4,939,913

CLASS 65

18.2 4,940,477
27 4,940,478
99.2 4,940,479
356 4,940,480

CLASS 68

22 R 4,939,914

CLASS 70

277 4,939,915
373 4,939,916
456 R 4,939,917

CLASS 71

76 4,940,481
92 4,940,482
94 4,940,483
4,940,484
96 4,940,485

CLASS 72

20 4,939,918
181 4,939,919
237 4,939,920

CLASS 73

1 R 4,939,921
10 4,939,922
40.5 R 4,939,923
49.3 4,939,926
61.1 C 4,939,924
61.4 4,939,925
81 4,939,927
118.1 4,939,928
4,939,985
159 4,939,929
201 4,939,931
317 4,939,932
379 4,939,933
431 4,939,934
517 AV 4,939,935
780 4,939,930
862.07 4,939,936
862.36 4,939,937
862.38 4,939,938
862.44 4,939,939
864.21 4,939,943
864.74 4,939,940
865.8 4,939,941
865.9 4,939,942

CLASS 74

49 4,939,944
89.13 4,939,945
89.15 4,939,946
422 4,939,947
473 R 4,939,948
551.2 4,939,950
552 4,939,951
579 E 4,939,952
733.1 4,939,954
858 4,939,956
866 4,939,957
867 4,939,958

CLASS 75

10.19 4,940,486
229 4,940,490
384 4,940,487
407 4,940,489
500 4,940,488

CLASS 81

44 4,939,959
60 4,939,961
124.4 4,939,960

CLASS 82

1.11 4,939,962
19 4,939,963
113 4,939,964
4,939,965
165 4,939,966

CLASS 83

150 4,939,967
886 4,939,968

CLASS 84

293 4,939,970
313 4,939,971
422.4 4,939,972
605 4,939,973
609 4,939,974
626 4,939,975
719 4,939,969

CLASS 89

8 4,939,976
14.4 4,939,977
33.14 4,939,978
34 4,939,979
46 4,939,980

CLASS 91

166 4,939,981

CLASS 92

62 4,939,983
92 4,939,982
176 4,939,984

CLASS 98

42.1 4,939,986

CLASS 99

468 4,939,987
516 4,939,988

CLASS 019

105 4,939,815

CLASS 100

13 4,939,989

CLASS 101

109 4,939,990
115 4,939,991
183 4,939,992
348 4,939,994

CLASS 102

202.14 4,939,993
214 4,939,995
501 4,939,996
503 4,939,997

CLASS 104

12 4,939,998
88 4,939,999
295 4,940,000
307 4,940,001

CLASS 105

136 4,940,002

CLASS 106

494 4,940,492

CLASS 108

44 4,940,003

CLASS 110

182.5 4,940,004
4,940,005
233 4,940,010
243 4,940,006
347 4,940,007

CLASS 114

39.1 4,940,008
267 4,940,021
343 4,940,009

CLASS 116

277 4,940,011

CLASS 118

62 4,940,013
301 4,940,012
658 4,940,014
723 4,940,015

CLASS 119

1 4,940,016
18 4,940,017
29 4,940,018
106 4,940,020
148 4,940,022
522 4,940,019

CLASS 122

13 R 4,940,024
510 4,940,025

CLASS 123

53 R 4,940,026
73 AD 4,940,027
90.39 4,940,048
185 B 4,940,028
198 D 4,940,030
257 4,940,029
339 4,940,031
424 4,940,032
425 4,940,033
497 4,940,034
4,940,035
506 4,940,036
4,940,037

CLASS 125

13.01 4,940,038
15 4,940,039

CLASS 126

21 A 4,940,040
110 R 4,940,041
344 4,940,042

CLASS 128

24 A 4,940,050
75 4,940,043
80 C 4,940,044
4,940,045
81 R 4,940,046
90 4,940,047
200.18 4,940,051
205.24 4,940,049
419 PG 4,940,052
4,940,053
4,940,054
639 4,940,056
653 A 4,940,055
4,940,057
653 R 4,940,058
688 4,940,059
715 4,940,023
735 4,940,060
754 4,940,061
772 4,940,062
774 4,940,063
784 4,940,064
4,940,065
882 4,940,066

CLASS 134

1 4,940,494
3 4,940,493
38 4,940,491

CLASS 136

256 4,940,495
4,940,496

CLASS 144

2 R 4,940,067

CLASS 148

23 4,940,498

CLASS 149

2 4,940,497

CLASS 150

132 4,940,068

CLASS 152

544 4,940,069

CLASS 156

69 4,940,499
89 4,940,847
204 4,940,500
252 4,940,501
272.2 4,940,502
279 4,940,503
307.4 4,940,848
500 4,940,504
584 4,940,506
612 4,940,505
636 4,940,507
643 4,940,508
653 4,940,509
656 4,940,510
4,940,511

CLASS 160

176.1 4,940,070

CLASS 162

109 4,940,512
112 4,940,513
168.2 4,940,514
363 4,940,515

CLASS 164

7.2 4,940,071
35 4,940,072
361 4,940,073
412 4,940,074
446 4,940,075
452 4,940,076
463 4,940,077
472 4,940,078

CLASS 165

2 4,940,079
9 4,940,080
9.1 4,940,081
42 4,940,083
76 4,940,084
80.3 4,940,085
173 4,940,086

CLASS 166

88 4,940,087
109 4,940,088
117.5 4,940,089
270 4,940,090
4,940,091
311 4,940,092
332 4,940,093
373 4,940,094
378 4,940,095

CLASS 172

44 Re.33,255
443 4,940,096

CLASS 174

35 GC Re.33,256
52.5 4,940,855
94 R 4,940,856
152 GM 4,940,858
174 4,940,857

CLASS 175

296 4,940,097
320 4,940,098
374 4,940,099

CLASS 180

68.1 4,940,100
69.4 4,940,101
79.1 4,940,102
132 4,940,103
4,940,104
133 4,940,105
139 4,940,106
142 4,940,107
197 4,940,109
209 4,940,110
219 4,940,111

CLASS 181

113 Re.33,257
145 4,940,108
290 4,940,112
296 4,940,113

CLASS 184

6.12 4,940,115
6.3 4,940,114

CLASS 186

61 4,940,116

CLASS 187

101 4,940,117

CLASS 188

67 4,940,118
73.31 4,940,119
73.36 4,940,120

CLASS 191

12.4 4,940,859

CLASS 192

3.31 4,940,122

58 B 4,940,121
4,940,123
70.28 4,940,124
85 AA 4,940,125
89 B 4,940,126

CLASS 198

350 4,940,127
395 4,940,128
418.6 4,940,129
432 4,940,130
524 4,940,131
750 4,940,132
831 4,940,133

CLASS 200

60 4,940,860
84 R 4,940,861
144 B 4,940,862
4,940,863
342 4,940,864

CLASS 202

202 4,940,134

CLASS 204

14.1 4,940,516
78 4,940,517
128 4,940,518
130 4,940,519
157.71 4,940,520
164 4,940,521
192.1 4,940,522
192.12 4,940,523
242 4,940,524
252 4,940,525
300 EC 4,940,526
401 4,940,527
427 4,940,528

CLASS 206

3 4,940,135
37.1 4,940,250
38.1 4,940,136
139 4,940,137
218 4,940,138
362.2 4,940,139
405 4,940,140
430 4,940,141
444 4,940,142
553 4,940,143
610 4,940,144

CLASS 208

61 4,940,529
89 4,940,530
120 4,940,531
138 4,940,532
216 R 4,940,533

CLASS 209

169 4,940,534
250 4,940,535
580 4,940,850
592 4,940,536
662 4,940,145

CLASS 210

96.1 4,940,537
137 4,940,538
149 4,940,539
150 4,940,540
321.8 4,940,541
4,940,542
369 4,940,543
603 4,940,544
609 4,940,545
613 4,940,546
643 4,940,547
656 4,940,548
695 4,940,549
4,940,550
743 4,940,551

CLASS 211

13 4,940,146
40 4,940,147
181 4,940,148
186 4,940,149
188 4,940,150

CLASS 215

11.1 4,940,151
11.5 4,940,152
12.2 4,940,153
249 4,940,154

CLASS 219

10.491 4,940,870
10.55 A 4,940,865
4,940,866
10.55 E 4,940,867
4,940,868
10.55 F 4,940,869
69.12 4,940,871
69.13 4,940,872
84 4,940,873
87 4,940,874
89 4,940,875
110 4,940,876
121.5 4,940,877
121.64 4,940,878
121.67 4,940,879
4,940,880
121.69 4,940,881
146.22 4,940,882
200 4,940,883
203 4,940,884
365 4,940,885
457 4,940,886

CLASS 220

6 4,940,155
22.3 4,940,156
254 4,940,157
258 4,940,158
404 4,940,159

CLASS 221

34 4,940,160
67 4,940,161
129 4,940,162
193 4,940,163

CLASS 222

66 4,940,164
129.1 4,940,165
136 4,940,166
153 4,940,167
4,940,168
399 4,940,169
402.1 4,940,170
402.18 4,940,171
505 4,940,172

CLASS 224

151 4,940,173
257 4,940,174
324 4,940,175

CLASS 225

96.5 4,940,176

CLASS 227

7 4,940,177

CLASS 228

55 4,940,178
56.3 4,940,179
122 4,940,180
180.2 4,940,181

CLASS 229

1.5 B 4,940,189
122 4,940,190
125 4,940,191

CLASS 235

381 4,940,887

CLASS 237

12.3 B 4,940,182

CLASS 238

310 4,940,183

CLASS 239

71 4,940,184
126 4,940,185
337 4,940,186

CLASS 241

79.1 4,940,187
275 4,940,188

CLASS 242

35.5 A 4,940,192
107.3 4,940,193
288 4,940,194

CLASS 244

1 R 4,940,195
54 4,940,196
102 R 4,940,197

CLASS 248

37.3 4,940,199
48.1 4,940,198
97 4,940,200
101 4,940,201
142.1 4,940,202
188.9 4,940,203
688 4,940,204

CLASS 249

63 4,940,205

CLASS 250

208.1 4,940,888
214 R 4,940,889
216 4,940,890
227.15 4,940,891
227.24 4,940,892
236 4,940,310
251 4,940,893
324 4,940,894
332 4,940,895
338.3 4,940,896
4,940,897
338.4 4,940,898
343 4,940,900
370.09 4,940,901
506.1 4,940,899
573 4,940,902

CLASS 251

52 4,940,206
65 4,940,207
144 4,940,209
160 4,940,210
315 4,940,208

CLASS 252

51.5 A 4,940,552
182.1 4,940,553
357 4,940,554
543 4,940,555

CLASS 254

134.3 R 4,940,211

CLASS 261

64.1 4,940,212

CLASS 264

15 4,940,556
26 4,940,557
46.7 4,940,558
65 4,940,843
130 4,940,559
211 4,940,560
225 4,940,561
234 4,940,562
257 4,940,563

CLASS 266

152 4,940,213
235 4,940,214
275 4,940,215

CLASS 269

32 4,940,216
50 4,940,217
322 4,940,218

CLASS 271

2 4,940,219
4,940,220
107 4,940,221
127 4,940,222
181 4,940,223
263 4,940,224
296 4,940,225

CLASS 272

70 4,940,226
72 4,940,227
76 4,940,228
86 4,940,229
130 4,940,233

CLASS 273

1 GA 4,940,234
1.5 A 4,940,231
1.5 R 4,940,232
72 A 4,940,247
76 4,940,230
183 D 4,940,236
189 R 4,940,237
199 R 4,940,238
236 4,940,235
243 4,940,239
260 4,940,240
261 4,940,241
287 4,940,242
326 4,940,243
403 4,940,244
416 4,940,245
421 4,940,246

CLASS 277

80 4,940,248

CLASS 279

41 R 4,940,249

CLASS 280

414.1 4,940,251
418.1 4,940,252
629 4,940,253
808 4,940,254
809 4,940,255
837 4,940,256

CLASS 282

29 B 4,940,257

CLASS 283

81 4,940,258

CLASS 285

3 4,940,259
4,940,260
112 4,940,261
114 4,940,262
342 4,940,263
405 4,940,264

CLASS 292

113 4,940,265
227 4,940,266
263 4,940,267
317 4,940,268
337 4,940,269

CLASS 293

122 4,940,270

CLASS 294

1.1 4,940,271

CLASS 296

37.8 4,940,275
97.5 4,940,272
97.6 4,940,273
97.7 4,940,274
136 4,940,276
164 4,940,277
166 4,940,278
181 4,940,279
190 4,940,280
194 4,940,281
204 4,940,282
216 4,940,283

CLASS 297

284 4,940,284
429 4,940,286
473 4,940,285

CLASS 298

23 R 4,940,287

CLASS 299

37 4,940,289
79 4,940,288

CLASS 303

6.01 4,940,290
15 4,940,291
81 4,940,292
110 4,940,293
115 4,940,294
117 4,940,295

CLASS 307

122 4,940,903
262 4,940,904
278 4,940,905
296.1 4,940,906
359 4,940,907
443 4,940,908
465 4,940,909
591 4,940,910

CLASS 310

87 4,940,911
162 4,940,912
216 4,940,913
326 4,940,914
338 4,940,915

CLASS 312

100 4,940,296
138.1 4,940,297
228 4,940,298
285 4,940,299

CLASS 313

306 4,940,916
414 4,940,917
487 4,940,918
526 4,940,919
559 4,940,300

CLASS 315

8 4,940,920
219 4,940,921
246 4,940,922
248 4,940,923

CLASS 318

560 4,940,924
587 4,940,925
603 4,940,926
809 4,940,927

CLASS 322

28 4,940,928

CLASS 323

222 4,940,929
273 4,940,930

CLASS 324

121 R 4,940,931
158 F 4,940,935
158 MG 4,940,932
4,940,933
158 R 4,940,934
174 4,940,936
207.22 4,940,937
212 4,940,938
236 4,940,939
309 Re.33,259
4,940,940
312 4,940,941
321 4,940,942
338 4,940,943
425 4,940,944
438 4,940,945
4,940,946
613 4,940,947

CLASS 329

307 4,940,948

CLASS 330

262 4,940,949

CLASS 331

2 4,940,950
4 4,940,951
11 4,940,952
96 4,940,953

CLASS 332

103 4,940,954

CLASS 333

204 4,940,955
209 4,940,956

CLASS 335

202 4,940,957
230 4,940,958

CLASS 338

13 4,940,959
4,940,960
21 4,940,961

CLASS 340

313 4,940,963
438 4,940,964
460 4,940,965
479 4,940,962
551 4,940,966
567 4,940,967
572 4,940,968
653 4,940,969
721 4,940,971
726 4,940,970
747 4,940,972
764 4,940,973
825.080 4,940,974
825.44 4,940,975
870.02 4,940,976

CLASS 341

143 4,940,977
150 4,940,978
152 4,940,979
159 4,940,980
161 4,940,981
169 4,940,982
171 4,940,983

CLASS 342

26 4,940,987
93 4,940,988
173 4,940,984
174 4,940,985
410 4,940,986

CLASS 343

749 4,940,989
773 4,940,990
795 4,940,991
803 4,940,992

CLASS 346

76 PH Re.33,260
4,940,993
4,940,994
140 R 4,940,995
4,940,996
4,940,997
4,940,998
4,940,999
145 4,941,000
154 4,941,001
160 4,941,002
4,941,003
4,941,004

CLASS 350

3.6 4,940,301
96.11 4,940,303
96.12 4,940,302
96.13 4,940,304
96.14 4,940,305
96.16 4,940,306
96.21 4,940,307
162.2 4,940,308
171 4,940,309
245 4,940,311
286 4,940,312
342 4,940,313
355 4,940,314
357 4,940,315
358 4,940,316
588 4,940,317
611 4,940,318
613 4,940,319
616 4,940,320
633 4,940,321
637 4,940,322

CLASS 351

203 4,940,323

CLASS 354

195.1 4,941,005
299 4,941,006
320 4,941,007
4,941,008
402 4,941,009
407 4,941,010
430 4,941,011
478 4,941,012

CLASS 355

20 4,941,013
27 4,941,014
200 4,941,015
202 4,941,016
218 4,941,017
245 4,941,018
251 4,941,019
275 4,941,020
285 4,941,021
298 4,941,022
319 4,941,023

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28.5 4,940,330
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328 4,940,325
336 4,940,326
338 4,940,327
345 4,940,328
349 4,940,331
417 4,940,332
432 4,940,333

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16 4,941,025
23.12 4,941,027
23.13 4,941,028
23.4 4,941,026
23.6 Re.33,261
30 4,941,029
43 4,941,030
45 4,941,031
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71 4,941,034
75 4,941,033

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60 4,941,036
80 4,941,037
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187 4,941,049
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213.15 4,941,052
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340 4,941,055
443 4,941,057
497 4,941,056

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67 4,941,058
72.2 4,941,059
99.05 4,941,060
106 4,941,062
120 4,941,064
128 4,941,065
133 4,941,066

CLASS 361

119 4,941,063
231 4,941,068
386 4,941,067
419 4,941,069

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61 4,941,074
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487 4,940,346
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624 4,940,348

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272 4,940,648
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176 4,940,664
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446 4,940,444
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607 4,941,206
617 4,941,207
618 4,941,208

CLASS 474

91 4,940,446
110 4,940,447
111 4,940,448
140 4,940,449
152 4,940,450

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2 4,939,949
233 4,939,953
278 4,939,955

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4 4,940,674
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45 4,940,677
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97 4,940,680
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263 4,940,685
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333 4,940,687

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220 4,940,691
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1.1 4,940,784
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200	4,940,788		268.8	4,940,799	262	4,940,811	318	4,940,819	868	4,940,833		4,940,464
581	4,940,789		327	4,940,800	388	4,940,780	775	4,940,821		**CLASS 600**	892.1	4,940,465
	CLASS 544		410	4,940,801			812	4,940,822	7	4,940,452		**CLASS 606**
8	4,940,790		462	4,940,802		**CLASS 560**	844	4,940,823	13	4,940,453	36	4,940,466
237	4,940,791			**CLASS 549**	12	4,940,812		**CLASS 570**		**CLASS 604**	66	4,940,467
321	4,940,792	267		4,940,804	103	4,940,813	179	4,940,824	1	4,940,454	170	4,940,468
349	4,940,793	302		4,940,803		**CLASS 562**		4,940,825	5	4,940,455		**CLASS 800**
	CLASS 546	326		4,940,805	849	4,940,814		**CLASS 585**	20	4,940,456	200	4,940,834
13	4,940,794	365		4,940,806			600	4,940,826	22	Re.33,258		4,940,837
16	4,940,795	434		4,940,807		**CLASS 564**	646	4,940,827	30	4,940,457	205	4,940,835
323	4,940,796	436		4,940,808	18	4,940,815	652	4,940,828	51	4,940,458		4,940,838
	CLASS 548	559		4,940,809	103	4,940,816	752	4,940,829	98	4,940,459		4,940,840
110	4,940,797			**CLASS 556**	305	4,940,817	828	4,940,830	143	4,940,460	220	4,940,836
		438		4,940,810	471	4,940,818	836	4,940,831	333	4,940,461		4,940,839
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	429	309,065		331	309,092		96	309,118	D15—	9	309,143		209	309,168	D28—	54.1	309,195
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